DOCUMENT RESUME

ED 239 650 IR 050 616

TITLE	Administrative Libraries Section. Special Libraries Division. Papers.
INSTITUTION	International Federation of Library Associations, The Hague (Netherlands).
PUB DATE	Aug 83
NOTE	102p.; Papers presented at the Annual Conference of the International Federation of Library Associations (49th, Munich, West Germany, August 21-27, 1983). Some pages will reproduce marginally.
PUB TYPE	Reports - Descriptive (141) -- Speeches/Conference Papers (150)
LANGUAGE	English; German
EDRS PRICE	MF01/PC05 Plus Postage.
DESCRIPTORS	Cataloging; Computer Programs; Computers; Foreign Countries; *Government Libraries; Information Networks; *Information Processing; *International Organizations; Library Associations; *Library Equipment; Library Technical Processes; Online Systems; Statistical Data; Telecommunications; *Videotex
IDENTIFIERS	*Information Technology; *West Germany

ABSTRACT

Six papers on the theme, "Administrative Libraries in a Technological World: Past, Present, and Future--A General Stocktaking and a State of the Art Report" focus on West German telecommunications and information technology and the use of data processing and other technological aids in West German administrative libraries. These papers, which were presented at the 1983 International Federation of Library Associations (IFLA) conference, include: (1) "Conventional Library Work in Administrative Libraries by Means of Modern Technology and Technical Equipment," in which Peter Schweigler (West Germany) outlines applications of "technical aids," such as photocopying machines and electronic typewriters, to the processes of library administration, acquisitions, cataloging, and to user services; (2) "The Statistical Literature Information System (STALIS) of the Federal Statistical Office as Starting-Point of International Networking," in which Hartmut Rahm (West Germany) describes STATLIS shared cataloging, information retrieval, and document delivery services; (3) "Major Developments in Hardware, Software, and Telecommunications in the Field of Information Storage and Retrieval," by D. Morgenstern (West Germany); (4) "Electronic Data Processing in Administrative Libraries: Opportunities, Effects, and Limitation," by Ernst Kohl (West Germany); (5) "Daten- und Textkommunikationsdienste der Deutschen Bundespost (Data and Text Transmission Services of the German Federal Postal Administration)" by Guntram Kraus (West Germany) (paper in German); and (6) "Interactive Videotex Applications in the Library and Information Field: A Look at the Developing West German Scene" by Gary L. Harris (West Germany). (ESR)

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ED239650

INTERNATIONAL FEDERATION OF LIBRARY ASSOCIATIONS
General Conference, Munich, West Germany, August 21-27, 1983
Administrative Libraries Section. Special Libraries Division. Papers.

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IFLA 1983

IFLA GENERAL CONFERENCE MUNICH 1983

Division: Special libraries

Section: Administrative libraries

15-ADM-1-E

Administrative libraries in a technological world:

past, present and future -

a general stocktaking and a state of the art report

1. Conventional library work in administrative libraries by means of modern technology and technical equipment

Appendix with 63 illustrations

by

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1 Preliminary remarks

The aim of this paper is not to discuss costly technical equipment such as mechanical transportation systems, telecommunication systems or computers which are used in large academic libraries. More important here are the smaller items in daily use: that is to say those technical aids which are also available, despite limited finances, to libraries with just a few thousand books or some tens of thousands.

Indeed it is the small or medium-sized libraries that have special need of technical aids and have to follow the trend of continously advancing technical progress. For the most part these libraries have only small staffs with which to provide their varied services. Such staff need to be adaptable and have to carry out a varied assortment of duties, sometimes side-by-side with one another and sometimes alternately. For this they need the best technical aids, and it is necessary to ensure that they meet the most recent technical standards. Only in this way can staff be released from routine work and can libraries be run rationally and with a high degree of efficiency in times of staffing shortage: and this in turn will help keep in check higher staffing costs.

By no means should it be expected that all these machines ought to be working continuously in order to pay their way or yield profits. The most important fact is that by the clear-sighted application of these machines the workload can be rationalised and staff productivity will be increased by using these "slaves".

2 How to obtain information about technical aids and methods.

There is an abundance of innovations, new machines and techniques. How can the librarian gather information about them?

2.1 Tours of Inspection

2.1.1 Visits to the well-known international fairs (e.g. Hanover Fair, held annually , where exhibitors from the office-supplying and information industries are situated in the CeBIT hall); or visits to the national specialist fairs (e.g. in the FRG the 2-yearly fairs in Cologne - Orgatechnik - and Munich - Büro '84 or Systems '83; in Austria there is the annual fair IFABO in Vienna).

2.1.2 Visits to the technical exhibitions of library conferences and meetings (e.g. IFLA conference, meetings of the national library associations such as those of the ALA , the LA etc.) where library suppliers and special firms offer the latest equipment.

2.1.3 Visits to libraries, especially to new buildings or reorganized libraries.

2.2 Printed Information

2.2.1 Catalogues of the large office suppliers - mostly voluminous with coloured illustrations and price lists.

2.2.2 Catalogues of the library suppliers, e.g. in the FRG the firms Eichmüller, EKZ-Einkaufszentrale für öffentliche Bibliotheken, Planmöbel Eggersmann, Pohlschröder, Schulz-Bibliothekstechnik, Vereinigte Schulmöbelfabriken and the corresponding firms in Austria; in the Netherlands the firm Bomefa; in the Scandanavian countries the Danish Library Design Bureau in Ballerup near Copenhagen; in the USA the firms Brodart and Gaylord; in Great Britain the firms Balmforth, Don Gresswell, Libraco, Library Design and Engineering, Librex Educational, Terrapin Reska; and in France the firms Mobilier V.S., Bomefa, Borgeaud, Buroguid, Lapouyade, Reska, Schulz, Strafor: - to mention just a few.

2.2.3 Serials in library and information science (and monographs). Many national serials have special columns for what is new in the technical field, e.g. the Austrian journal "Biblos" or the Dutch journal "Open". In the USA the journal "Library resources and technical services" and also the journal "College and research libraries" contain much that is stimulating. In the FRG a special journal is published for automation, building and technical equipment for archives, libraries and information science: this is the "ABI-Technik". There is also the "Nachrichten für Dokumentation". Relevant monographs - and essays - can be found in the abstracts journal "Library and information science abstracts".

2.2.4 In many countries there are special consultancy centres giving advice on all matters relating to the building, interior layout and technical equipment of libraries. The following examples can be cited: in the FRG, the Deutsches Bibliotheksinstitut in Berlin with its Department "Conventional Library Technology"; in the GDR in Berlin the "Methodisches Zentrum für wissenschaftliche Bibliotheken"; in the USA at the ALA Headquarters in Chicago, a centre which publishes its well-known "Library technology reports". In Austria there is a centre for interior layout and technical equipment at the Österreichisches Institut für Bibliotheksforschung, Dokumentation und Information .

2.2.5 Specialist journals dealing with office organisation continually report on new machines and appliances as well as new techniques and other factors affecting productivity such as light, temperature, noise etc.: an example of this kind in the FRG is the journal "BTS. Bürotechnische Sammlung".

After these preliminary remarks, we go on to the concrete equipment. I shall expressly name the producers, companies and products as examples, without any pretension to completeness, as my statements would be totally colourless and almost useless without any concrete information about products. Naturally there are numerous firms in competition with each other, which one should take into consideration in view of the differing functions, prices, and other conditions, and above all in view of servicing skills and customer service.

I regret that most of the examples in the following text are from Central Europe. But librarians from countries outside this area will be able to find firms and suppliers in their own region without undue difficulty; and where no national market exists - as in the developing countries - they may apply to the well-known firms in North America, Great Britain, France or Germany. Moreover many products are from international firms and are available worldwide.

3 Library technology with reference to library administration, acquisitions and cataloguing.

3.1 Handling the post (in the secretariat and post room)

A mechanical letter opener which quickly slits open all incoming mail is time-saving; and if there is a lot of mail an electric opener is worthwhile. (1)
A copying machine for use in the office can spare staff from having to walk long distances to the central copying room. There are small and excellent machines for the work-place (e.g. Topcopy from Geha) (2). Some of them copy on plain paper (e.g. Develop 10 or Canon PC 20) (3) (4). Addresses can be produced quickly (5) (6) with an addressing machine (e.g. Stielow). The machine from Adressograph-Multigraph uses print carriers which are made of a thin sheet of aluminium and can be typed on without any circumstances with an ordinary typewriter. On the other hand it is easy to type the addresses on to a sheet of normal plain paper and then to have them transformed by means of a copying machine into self-adhesive labels (e.g. Avery) bearing the required addresses in sharp black characters. Memory typewriters can also provide addresses (see 3.2.4). Paper shredders have recently become small and handy: some are the size of waste-paper baskets, and the "top-secret" shredder (from Geha) (7) fits comfortably on a desk. For mailing purposes an electronic weighing machine saves time, postage and hence money (e.g. Model 5029 for mail up to the weight of 500 g from Pitney Bowes; Model 6300 (8) for letters and parcels from Stielow) (9). There are also nowadays small electric franking machines whose use is worthwile even when there are only a few letters to be sent per day (e.g. Model 6300 from Pitney Bowes? Model 2205 from Stielow) (10).

3.2 Typed Work (in the secretariat, in the acquisitions' and cataloguing departments).

3.2.1 Typewriters

Here a revolution is underway. The progress in electronics and the application of microprocessor technology have increased the efficiency of these machines, and modern electronic typewriters give numerous possibilities for the processing of text. To-day work-places in cataloguing and acquisitions' departments, not to mention those in the secretariat, should only be equipped with electric or alternatively electronic machines. Here many stages of technical ease and efficiency are possible.

3.2.1.1 Already electrical (electro-mechanical) machines lighten the work-load appreciably (carriage return and line changing), particularly through the fantastic correcting possibilities. Boring erasing, which also ruins typewriters, is a thing of the past. Fidgeting with correcting devices, be they liquid or paper (e.g. Tippex), is no longer necessary. With the "cover-up technique" the lower half of the typing ribbon is a white band, similar to Tippex, which covers up the incorrect characters with a white film.

3.2.1.2 Machines which are more perfect make possible speedy corrections by means of the "Lift-off technique". Alongside the black carbon ribbon (in a practical cassette, which promotes easy change-over without dirtying one's fingers), there is a white correcting ribbon by which any incorrect characters and words may be corrected - almost invisibly. One just back-spaces to the incorrect character, repeats it, and it is eradicated - pulled off by the white correction ribbon. Then the new letter is typed in its place in a flash. What began with IBM's "No-Mistake-Machine" a few years ago, is now technically perfect and is available from almost all manufacturers. This phenomenal work-saver for all kinds of written work must be tried by all!

3.2.1.3 Electronic machines have 24 characters, the last line, or even more characters (e.g. 256, 1000) in their memory, and with every touch of the corrector key the incorrect words are eradicated letter by letter starting at the last letter and going backwards, without having to type in these letters again. Just as practical and time-saving is the "relocating" function. If one is writing on the sixth line, 18th letter, and discovers a mistake on the 2nd line, 5th letter, then all one has to do is return the carriage to the location of the mistake, correct it and then press the "relocate" key. The machine returns automatically to the original point so that work may continue.

These correcting facilities constitute great progress, particularly for the librarian of a small library. In cataloguing, for example, which is different from the work of the secretariat, no continuous texts are written. More than likely many different types of work will be carried out, and interruptions by library users are numerous. If insertions have to be made while analysing titles for cataloguing, or if typing errors are made while analysing titles for cataloguing, or if typing errors are made owing to lack of concentration, the text can thus be continually corrected. These correction facilities are already half-way towards the more expensive automatic machines (word processors) which have video display units at the place of work connected to the computer with its almost limitless possibilities for correcting work.

It needs only to be mentioned in passing that nearly all modern machines are now equipped with printing elements known as daisy-wheels - the golf-ball printing element being slowly phased out. As a result the print is even clearer and one can also use a greater variety of print types (e.g. OCR types or poster types). There is a maximum of 100 characters on a daisy-wheel, and each wheel costs about DM 50. Some office equipment suppliers with their own workshops or specialists will undertake to change unnecessary characters for those which are required (e.g. other types of brackets). A further advantage of these machines is that they are noticeably quieter.

A typical electronic typewriter brings considerable relief to the working situation with its many facilities: e.g. the Triumph Adler SE 1005 is equipped with: (11)

- type-wheel with a maximum of 100 characters;
- distribution switch for either 10, 12 or 15 characters per inch (other machines also have type-script with proportional spacing), which is ideal for catalogue cards where space is limited,
- a permanent function for all typing/printing keys (e.g. underlining);
- express corrector for the automatic eradication of a maximum of 132 characters not confined to any particular line (some other machines can cope with several hundreds of characters) - this is the "Lift-off" technique;
- relocate function: half-spacing key;
- a memory for 16 characters that guarantees the uninterrupted flow of typing/printing even when moving on to a new line;
- tabulator;
- electronic paper transport, carbon ribbon in cassettes, and much more.

3.2.1.4 Electronic memory typewriters can rationalize the work-load more efficiently. They have a constant internal memory containing a few hundred up to several thousands of characters. (e.g. Olivetti ET 231 which holds 16,000 characters = 10 DIN a4 size pages). Terms which occur repeatedly, such as date, forms of address, greetings, addresses and short texts can be recorded in the memory, to be called up whenever necessary.

These memory typewriters are ideal for the reproduction of catalogue cards. The record for a title requires on average some 200 characters, and only seldom has it 500 characters. If not too many copies are needed the text required can be written once with the typewriter and recorded in the memory. Finally, at the press of a button, the text can be rewritten as often as required. Naturally this technique is not ideal for large quantities and the economic limit is on average 4 catalogue cards per title. It is worth noting that one is spared all further reproduction work, part of which is very troublesome (e.g. sorting), with its time-consuming delays (12). At the same time the machine can also provide the various "headings" that are required for the individual catalogue cards of a particular title.

The University Library of the Montanistische Hochschule in Leoben/Austria has developed a technique to produce catalogue cards as mentioned above and to print accession lists of new books later on as a separate job in DIN A4 format: this is done automatically and the titles are filed by subject classification.

Catalogue cards can also be produced by using continuous stationery - card stock, folded zig-zag, with perforated upper and lower edges. In cases like this the typewriter is fitted with a tractor feed. In the FRG the firm Eichmüller supplies Olympia typewriters, which can be used both for correspondence and the production of catalogue cards as described above. Moreover they can be used to produce book-labels using the SE-LIN technique (see 4.8): these are very practical, multi-purpose machines especially for the small library.

Machines that have a line-by-line video display provide even more foolproof typing (13). The video display is situated above the typewriter keyboard and shows 20 - 40 typed characters, which can be corrected before the print-out. When the machine is printing from memory, the text can be stopped at any time, and with the aid of the video display, new text material can be fitted in. More versatile machines have a built-in memory in the form of diskettes, so that if required long texts can also be put into subsidiary memories via "Mini-diskettes" (e.g. standard texts for complaints, letters of thanks etc.).

Olympia

3.2.1.5 Electronic memory typewriters with a video display unit) More intelligent electronic memory typewriters can be converted by means of a video display unit and a separate simple cassette recorder into a small word-processing machine. The typewriter Triumph-Adler SE 1005 (price DM 1995), for example can be connected to a video display unit which shows 20 lines each containing 80 characters (= 0.5 pages DIN A4). Moreover there is a working memory with 16 K (= 10 DIN A4 pages) and a 16-K-Prom for text-software.

Integrated is an interface for audio-cassette recorders. The name of this configuration is "alpha-text primo", and the price in the FRG including the typewriter is about DM 7,000 (14). This machine can be used to write down texts, store them in the memory, write them down automatically and, at the same time, modify them by means of the video display; or it can be used to add new chapters, transpose texts to other places, build-up tables and much more.

Electronic memory typewriters may also be connected by means of modems to computers and can serve as genuine input and output devices.

For all these reasons memory typewriters constitute a tremendous working aid especially to the staff of smaller libraries, who have to perform so many different duties at one point of work: with a well thought-out work schedule memory typewriters can be used to optimum effect. Hence they have been so thoroughly dealt with in this paper. They give libraries which have no access to a computer new possibilities for rationalization.

3.2.2 Furniture and equipment

Copies of material to be typed need a document holder so as to avoid typist's fatigue and postural damage to the typist (15). There are many different models (e.g. firm Simplex). Generally the document holder should stand behind the keyboard, not to the side, as continual turning of the head leads to neck-ache. In the case of a typewriter it should stand above and behind the typewriter; for display terminals, it should be located, whenever possible, between the keyboard and the screen.

As well as a desk and a typewriter table, or the space-saving angle-table combination, another work-place is needed for the data-viewing appliance, the terminal. The working place for the new video display terminal must be ergonomically designed and equipped, i.e. the working table must suit the needs and the body dimensions of the worker and above all be capable of being adjusted to the individual needs of other workers, as work on display terminals is usually carried out by one person for half a day only. An ergonomic table offers adjustable height and depth for the working surface, rotation and tilting of the display screen in order to avoid dazzle, and it provides facilities for regulating the optimal viewing distance and the position of the document container - and, if applicable, the special document holder (see above). In addition the keyboard layout should provide hand support (on which the hands can rest during short pauses). (from Gutmann, Gumpo) (16) (17).

A complete work-place for the typist also needs an upholstered, adjustable,

well-sprung swivel-chair with a functional back rest and a stable base with 5 legs on braking wheels. Of particular importance is also a functional foot-rest with adjustable tilt. The adjustment of the height of the chair and the inclination of the foot rest can fully compensate for the fixed height of a normal table which proves to be unsuitable. Another important factor is good illumination of the work-place, which can be improved by using modern energy-saving lamps (e.g. Wacolux from the firm Waldmann) (18)

3.3 Acquisition work

Even the small library need not do without the rational visible strip index, well known as "Kardex" (19). Files similar to the Leitz-holders offer the same convenience. A DIN A4 file takes 62 index sheets with viewing strips (Huwa) (20) For small stocks of journals there is also a half-file with 31 sheets. For bigger indexes electromechanical minilifts (e.g. Definitiv, Remington-Rand) are a practical proposition. They have a filing capacity of 10 or more running metres (21) (22)

For bookkeeping and accounting as well as for statistics electronic calculators with a printing facility are necessary (23) One of the smallest and cheapest (ca. DM 100) mini-printers is the BC-1028 from Toshiba: it weighs only 320 g.

3.4 Cataloguing work

There are several methods for duplication of catalogue cards: which method is the most economical depends very largely on the number of copies required. The small or medium-sized library as a rule has only 2 or 3 different catalogues and needs relatively few duplicates for each record. In addition to the non light-resisting method of spirit-carbon-duplicating there is the widespread "Minigraph"-method which supplies light-resisting prints by means of the screen-printing process. The print carriers are small wax matrices (in the FRG available from the firm Eichmüller) (24).

The attractive method of duplicating catalogue cards by means of copying machines (the master can be produced here by the typewriter on normal plain paper with every facility for quick corrections) has hitherto been burdened with the tiresome question of format - and with cutting and collating problems. For a few years now the U-Bix CP 1 copier has been on the market and has turned out well. It is the first special copying machine for reproducing catalogue cards in the international library format. It produces copies measuring 125 x 75 mm (5 x 3 in.) on to card stock of 190 - 250 g/m^2, and it has a working speed of 18 cards/min. Even cards with round or slotted holes can be printed on. (Price about DM 10,000).

In many towns small libraries which cannot use up the capacity of the machine on their own are cooperating with other libraries. A further development is the U-Bix CP 2, which produces cards from the international library format up to the format DIN A6 (postcard size) on the scale 1:1 (price about DM 10.000)(25).

Another innovation has emerged for the duplication of catalogue cards on normal copying machines. Library suppliers are delivering card stock in a quality of 160 g/m^2 with 4 cards per sheet, pre-punched with either round or slotted holes. There is a special screen in plastic with a white raster which is useful for positioning the texts of the records in such a waythat black margins on the copies can be avoided. Also new is a hand/, small table copier from Toshiba(26). It copies all formats from DIN B4 (larger than DIN A4) to the international library format and can work with paper qualities ranging from 80 g/m^2 normal paper up to 250 g/m^2 card stock for cataloguing. Even catalogue cards in the international library format pass through the copier without problem. The price is about DM 7,500. A variant of the model can also provide reduction facilities (in DIN reduction ratios): thus, for example, catalogue cards in postcard size (DIN A6) can be reduced to the international library format. The price is about DM 9,500.

As to the production of catalogue cards by means of memory typewriters see 3.2.1.4.

Moreover catalogue cards may also be produced and duplicated with the matrix printer "Mini-Legitronic", (see 2.8). The printing of catalogue cards is also done by a sophisticated method of cataloguing by means of Commodore microcomputers in Lower Saxony(Innovation Centre in the university library of Braunschweig).

3.5 Book binding

Without attempting to enter into competition with the professional binderies, every library will find that the following technical equipment can be successfully used for smaller tasks: the guillotine, the stapler, some form of thermal binding system (e.g. Bindit or Xerox Cheshire Binder 750 II)(27) or spiral binding systems (e.g. Planax-Plastic Binder), a machine for applying laminated plastic film to book covers (e.g. Folimat by the firm Schulz-Bibliothekstechnik).

3.6 Book trolleys

A standard book trolley which is 60 cm long, 40 cm wide and about 80 cm high

can not be regarded as the most suitable model for every purpose. There are some other models which are space-saving, e.g. small trolleys with 3 wheels for use at the writing/typing desk (e.g. firm EKZ)(28). Other trolleys are very manoeuvrable and can smoothly pass over door-sills (e.g. firm Schulz-Bibliothekstechnik)(29). Trolleys as used in supermarkets are cheap, very robust and there are no problems of acceptance by librarians - or by users for self-servicing. For the transportation of heavy loads on uneven floors trolleys fitted with elastic or pneumatic tyres - and, if necessary, with brakes - are very suitable(30)(31)(32)

4. Library technology as applied to user services.

4.1 Communication

4.1.1 Telephone technology (e.g. bureau telefon teamset 200 from Siemens)(33)

New telephone technology is work-saving in every way, and does away with much of the work which frays one's nerves. Push-button dialling and automatic redialling when the number is engaged are already proving to be a great relief. It is very convenient, particularly for a librarian, to have a free-speech and loudspeaking system, especially when giving information from the videx cards (from catalogue cards) and when leafing through bibliographies or when having to make notes. Then, of course, there is the number memory facility, by which one can dial the most frequently used numbers automatically at the press of a button. The memory is freely programmable, and numbers can be changed at will. In cases like this the numbers are on a video display for verification. During a conversation a digital clock runs, so that the length of the call (in units of time) can be checked. All these functions are found in a simple telephone computer(34), which one can have fitted as an accessory to a telephone. The price is about DM 350-400.

Such "telephone comfort" has in fact a great rationalising effect, saving time, money and above all nervous energy, particularly when phones are always engaged and the lines are busy. The smaller the library, the more duties each member of staff has to perform; and the more often it is that members of staff have to change over to work places which are not manned for the whole of the day; hence in cases like this the more "intelligent" the telephone system needs to be. Parallel phones (2 telephones with 1 number to 2 work places (from which conversations can be held by choice) are very helpful. Other appliances facilitate the diversion of calls: the librarian has to leave his usual work-place and transfer all incoming calls to, for example, the stack room where he has some work to do. He therefore remains

contactable. He can also link the telephone during the lunch-hour to the continually occupied reading room. An essential working aid, particularly at those service points which are not continuously staffed, is a telephone answering system (35) When fitting out a new office or library, or changing the present telephone equipment, one should seek specialist advice in all these technical fields.

4.1.2 Intercom Systems

An intercom system (intercommunication system or a duplex installation) for internal use can be very useful and is not expensive.

4.2 Information

4.2.1 Information Displays

There are many helpful devices to help display telephone directories to good effect (case with wings), bibliographies (Books-in-print-boy) or information leaflets or brochures (display stand, periodical display racks). (36)

4.2.2 Means of organisation for catalogues and files

Such means are of ever-increasing need in libraries of all sizes. On the one hand there are catalogue cabinets for conventional card catalogues (37) For this purpose the modern catalguing units entirely made of plastic are now in genuine competition with those made of wood. (e.g. firm Schulz-Bibliothekstechnik). For title indexes (e.g. for periodical indexes) visible strip indexes have proved to be a thoroughly good system (e.g. Kardex) (38) On the other hand the special library has to accommodate microfiche catalogues as well as COM - catalogues and lists along with microfilms of journal volumes or monographs, even when such material is not their own output and comes from many different outside sources. Various storage devices are on the market. There are table stands for microfiche, rotating stands, wall hangers and ring-files (as well as books with flip-over inserts), storage boxes and card trays (e.g. Durabel by the firm Hunke & Jochheim) (39)

4.3 Furniture and equipment for exhibitions

There is a great variety of exhibition cases and display panels on the market, including ancillary equipment such as brackets, supports and cross-pieces. (40) (41)

4.4 Microform Readers

There are various types of readers to read catalogues in microform and other material on film. It is of importance that the readers are fitted with a device for interchanging lenses because microfiche and microfilm both have various reduction ratios (e.g. 1:20, 1:48, 1:72) (42) A Reader-Printer is dealt with in 4.5.

4.5 Copying machines and their accessories

The market for copying machines is immense. For the evaluation of all important criteria, market surveys which appear in technical journals dealing with office organization are very useful. Of great interest is printing on the reverse side of the page (to save paper and postage; or to fill up gaps in bound volumes) and the possibility of reduction (to save paper and postage).

The first plain paper copier with reduction and enlargement facilities in DIN reduction/enlargement ratios was Minolta's EP 710 (43) The enlargement facility is used for graphical work (posters, headings for texts, signs); and also for the enlargement of drawings and plans (technical drawings, maps and architectural plans) as well as for the production of bigger and more easily legible texts on transparancies for overhead projectors used for daylight projection.

Relatively new are Reader-Printers which use normal paper: Copex LK-P from Agfa-Gevaert, Regma LR 7 from Rhône-Poulenc (price about DM 15,000) (44)

The following accessories save work: coin-operated machines, coin change machines; counters for registering the number of copies made to help calculate costs; systems for the registration and book-keeping of copy costs (System Copytex by the firm Schomäcker) (45)

4.6 Devices for registration and safety measures

Counters register the number of users (e.g. cheap mechanical counters at the door, turnstiles as used in supermarkets, light barriers). In the lending department electric stamping machines can support circulation work by (46) Reiner stamping the running number or the date onto lending forms. For the registration of book issues the technique of photo-charging is very work-saving (e.g. Karmac). Closed circuit TV for control and also book-theft detection systems (e.g. 3M Tattle Tape System or Knogo) will help to (47) protect library the library stock. Electronic alarms are installed to secure the (48) rooms against burglary (e.g. infrared detecting systems PID 16 or 50 from Zettler (49) to detect motion) and also to secure show cases (e.g. detection system Wachtel AS 2 from Zettler).- A movable box for returned books (e.g. Eichmüller) can be very useful (50).

4.7 Presentation of material

In addition to the various types of bookcases there is also available a very practical periodical case ('Zeitschriftenbox im Regal'), which can be used very flexibly on the shelves (From the firm Schulz-Bibliothekstechnik) (51) There are also special newspaper holders. Audiovisual media are offered (53) in special media carrels. Cupboards for clothes and brief cases help to solve the problem of keeping such things safe.

Lighting for shelves, vertically (52)

4.8 Signs, symbols and graphical design

Higher standards are always being set for signs and labelling as well as for graphic design in libraries. In many places the chaos of handwritten signs has yet to be abolished. There are some excellent devices for the production of signs on the market. They give good results without requiring special graphic skills on the part of the operator: nor are they too demanding of staff time. But they are not very cheap and the problem is that they are not in constant use. Therefore what was mentioned above in respect of a copier for catalogue cards is also true here: small libraries should cooperate with each other, for example, when buying consumable materials or when repairs or customer service is needed.

Letters up to the size of 16 or 25 mm in height can be produced with the (54) Leteron-System (firm KTC) or the Dymo-System 2600. They are suitable for guidance signs and for rough orientation in rooms and corridors. It is possible to use colours. With the Varafont-System (firm KTC) or the lettering system from 3M letters up to 8 or 10 mm can be produced. They (55) are suitable for putting signs on furniture: for example, on catalogue drawers, or for printed matter. Coloured tapes for lettering with letters up to the size of 12.5 mm in height can be produced with the lettering system Dymo 2300. Different coloured letters with a width of 4 mm can be printed by the small manual printer Letrafix from Letraset.- It is important that all (56) these signs are made of non-reflecting material.

Moreover various different systems use single letters such as transfer letters or rub-down letters (e.g. Letraset, riwi, typoveen). Simple and extremely cheap signs can be produced by using stamps (e.g. lettering set (57) from the firm Neoprint) with letters up to 250 mm high. Signs can also be produced easily by typewriters using poster type. Machines with type-wheels only need a special type-wheel with poster type. All the signs produced by these different techniques can be enlarged to the size wanted by using a copying machine with an enlargement facility (e.g. Minolta EP 710, Canon).

For the production of book labels the well-known SE-LIN method can be used (58). If a normal typewriter is fitted with a special accessory plastic tapes can be typed on with poster type: later on the labels are cut off and are ready to be fused with heat on to the book spine (firm Eichmüller). When using a memory typewriter, the production of labels can be programmed by the system SE-LIN ES III in such a way that book numbers in accession order are produced automatically.

The electronic label printer "Mini-Legitronic" prints book labels with letters up to the size of 7 mm in 8 different kinds of letters and in small letters or in capital letters. Bold face is possible. The machine can also be used for the production and duplication of catalogue cards as well as for bar-code labels. Since print-outs of lists can be produced (arranged alphabetically by headings or in any other way), the machine makes possible integrated book processing (production of accessions' lists, catalogue cards, book labels, bar-code labels etc.). The reproduction of catalogue cards can be achieved by using continuous stationery. The machine works with card stock up to 190 g/m^2. The speed of printing is 100 characters/min. The configuration consists of an input terminal with a typewriter keyboard and a small screen (24 lines with 40 characters per line), a computer with a microprocessor control system, cassette drive to load the programs, a floppy-disk for quick data access with two drives and data memory and a matrix printer (9x7). The price is more than DM 10,000 (firm Eichmüller).

5. Library technology in the stack room and in areas open to the public

Even small libraries are expanding continuously and thus create new problems. Further increasing numbers of catalogue cards can be stored in electro-mechanical card conveyors, for example in documentation files, or in microfiche collections. card conveyors, for example in documentation files, in collections of patent li- (21) (22) teratur on microfiches etc. (e.g. Definitiv Organisation, Remington Rand). Growing collections of slides are stored in a compact form in a case capable of holding 5000 slides, approximately the size of a desk (e.g. Abodia from Bonacker) (59)

When the empty space comes to an end compact shelving can be helpful. New in this field is a very space-saving movable bookcase which is (with a height of 225 cm) only 50 cm in depth (double-sided bookcase) instead of being 70 or 60 cm (firm Pohlschröder) (60) When the stack room is made larger and the gangways become longer and longer a roller device for books (as used in the Eidg. Technische Hochschule Library in Zurich) can be helpful, (61) as can a book-bicycle (as in the University Library in Freiburg in Baden-Württemberg), or an electric scooter (various models are in use in German libraries, e.g. a new model is available from the firm Schulz-Bibliotheks- (Uniquick) technik). They could replace expensive electromechanical book conveyors, (62) such as belt conveyors with or without baskets. Shorter conveyor distances can be mechanised relatively cheaply by means of roller conveyors. Longer stretches

horizontally, but now also between different floors, can be covered by smaller transportation systems. Small containers, each with a seperate electric motor (24 V) run along narrow tracks. This system is very space saving and flexible, and it can be adapted to any building, just like a pneumatic tube system (e.g. Siemens, Telelift). About 15 libraries in the FRG, and also the BritisH Library Lending Division in Boston Spa, Yorkshire, make use of this advanced technology such as this (Telelift) (63).

6. Conclusions

The machines and the equipment mentioned are only examples. Above all the descriptions of them are mostly very short. For detailed information please refer to the book "Schweigler, Peter: Einrichtung und technische Ausstattung von Bibliotheken. Wiesbaden: Reichert 1977". On the other hand one may apply to the manufacturer for information about his equipment.

An index with the addresses of the firms is added. International companies are entered, only listing the German branches.

IFLA 1983

I F L A 49 th. Council
and General Conference Munich
Division: Special Libraries
Section: Administrative Libraries

105-ADM-2-E/A

ADMINISTRATIVE LIBRARIES IN A TECHNOLOGICAL WORLD:

Past present and future - a general stocktaking and definition of stand.

(1) The Statistical Literature Information System (STALIS) of the Federal Statistical Office as starting-point of international networking.

by

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Hartmut Rahm

The Statistical Literature Information System (STALIS) of the Federal Statistical Office as starting-point of international networking.

The demand of state, economy and society for freely accessible information exceeds the mainly scientific contents of periodical and monographic literature. Especially for planning purposes, statistical information with comments on data collection and analysis is required on a large scale.

The information offered to the user of official statistics in the Federal Republic of Germany is provided, apart from printed publications, by means of three computer-based information services:

- STATIS-BUND for the compilation and evaluation of statistical results for the purpose of analysing, planning and decision making by aggregated statistical material referring to the Federal Republic of Germany. It should be emphasized that there is the possibility of special evaluations of statistical data and mathematical computations.

- VIDEOTEX-BUNDESSTATISTIK for the information of the public at large on major statistical data. The data transfer is made by connecting colour television sets to the public telephone network.

- STALIS, the Statistical Literature Information System of the Federal Statistical Office, to be introduced here, for documentary information concerning official and non-official statistics of the Federal Republic of Germany and foreign countries as well as international institutions.

STALIS has been used with success as a data banksystem at the Library of the Federal Statistical Office since the beginning of 1982. The exploitation of the valuable stock of this special library for

statistics has been improved and facilitated by complete documentary information and the user-oriented information services. STALIS has been developed under aspects of networking in order to serve as a starting-point of networking on the basis of the manifold connections existing between the special statistical libraries especially with regard to the exchange of literature.
The networking system is to offer centralized services by shared cataloguing and a comprehensive data base for statistical documents. For the participants in the networking system, the following services are available or being prepared:

- printing of cataloguing cards of international library size, especially for the alphabetical catalogues which can be continued in the conventional manner

- production of microfiche-catalogues based on the stored titles, arranged alphabetically according to corporate entry, descriptors, primary title or stock number

- SDI (selective dissemination of information) concerning access to statistical documents, arranged by subject

- retrospective search on demand, carried out by the library of the Federal Statistical Office. Bases for this searchwork are registers established for all relevant tags and requiring a minimum of computer time

- online-search via DATEX-L using the telephone network (may also be extended for online-search via EURONET). The system will be shown following this summary.

Let me first illustrate the possibilities of joining in STALIS, which might be of special interest to you. This information system for statistical documents has to make allowance for the different personal

and technical facilities which have already been mentioned in the evaluation of Hans K. Kullmer's inquiry "The Libraries of the National Statistical Offices in the World"[1], and in the paper by Walter Niedermeyer[2] concerning the organization of data exchange.

We may proceed from the fact that as part of the international exchange of literature, a considerable part of the documents published by the Central Statistical Offices is already available at the library of the Federal Statistical Office and other central statistical libraries.

Participation in networking for statistical libraries is possible on three different levels:

- for libraries with limited staff facilities it will be sufficient to provide for the delivery of the entire statistical documents. Via printed cards or microfiche catalogues prepared for the complete stocks by COM (computer output on microform) those libraries will be offered a bibliographic service covering not only their own but also the foreign statistical documents. Requests for statistical documents of these countries may be complied with by the Library of the Federal Statistical Office from the exchange stock

- for libraries with trained staff, even if they have no data processing facilities, participation in networking is possible by collaboration in cataloguing and indexing. The Library of the Federal Statistical Office provides specimens of the STALIS work sheets for data recording. The filled-in work sheets should then be sent to the Library of the Federal Statistical Office for data recording. Requests for statistical documents should be made by the participating library unless the documents are available as part of exchange agreements.

- for libraries with data processing facilities, the STALIS software package and programme documentation will be offered free of charge. These libraries will not only participate in cataloguing, indexing and the development of multilingual thesauri, but also in data recording. At regular intervals, magnetic tapes have to be sent to the networking

center for the exchange of the latest data recorded. As format for magnetic tape exchange should be used MARC - BNB or MAB 1 because of the existing transformation programmes.

Participation in cataloguing should follow the internationally-oriented rules for alphabetic cataloguing (RAK), which have been introduced by the libraries in the German-speaking countries in the past few years. Very imprtant for the international data exchange is the equal status provided by these rules for all languages. Title and corporate heading are recorded in the original language of the document. In this way it is possible for all participants of networking to use their own language for cataloguing.

Participation in indexing includes the cooperation in thesaurus development and subject indexing. Up to now, indexing was carried out only in the German language. In view of the fact that English is the most widely-used language, it would in our opinion be the best solution to choose English as the exchange language for the tags of subject indexing. The establishment of a bilingual English-German thesaurus following ISO-guidelines TC46 SC5 has been planned and should be accomplished in the foreseeable future. On this basis it would be necessary to establish bilingual thesauri for every language with libraries participating in indexing. The English version will then be used as a basis for transferring the terms into the indexing language, e.g. French or Spanish.
The successful establishment of a multilingual thesaurus requires a close cooperation on a multilingual basis.

A semi-centralized structure would seem to be most effective, the coordination, which should being done by a central steering committee. This committee, which should comprise representatives of all participating libraries would decide questions of principle and organize cooperation and the distribution of work. Whichever type of structure for the organization of work is chosen, its terms of reference should not only apply to the initial stages of the establishment of the thesaurus, but also hold for the continuous operations of revision and updating.

For thesaurus development, updating procedures should be provided for either on a continuous basis or at regular intervals, to deal with those changes which appear to be necessary in the light of previous experience. These changes relate to matters such as the admission and deletion of terms and relationships between terms. Any changes introduced into a hierarchy in one language must be equally valid for the terms of the other languages. For discussing problems of cataloguing and the organization of international cooperation, meetings during IFLA sessions would seem to be most effective.

Before presenting the possibilities of search work, let me first explain the other major functions of the STALIS data base system.

The correction system of STALIS permits the modification and updating of the stored titles at any time. The tags, which are to be supplemented or updated are shown on the terminal. One line underneath, individual signs may be altered, supplemented or deleted. More extensive alterations are made by updating the entire line after calling in the tag.

The print system permits to show the title on the terminal, to print catalogue cards and to produce lists of titles or COM by means of automatic data processing. The tags to be shown may freely be chosen by enumerating the desired tags. The terms with existing titles may be shown on the terminal before starting the search.

The data base system is working with so-called inverted registers. These registers, which are updated automatically when recording new titles, permit to save computer time during searching and printing of registers. The printing of registers with or without titles serves the purpose of producing stock lists as well as indexes of authors,institutions and descriptors.
Printed lists of corporate entries and the terms used for indexing have proved to be an indispensable instrument for the everyday work of cataloguing and indexing.
Because of its modular structure, the STALIS data base system may be extended for the automation of further library tasks. For example the

control of entries for acquisition by purchase or exchange as well as lending may be performed by additional subroutines.
The efficiency of the automation of individual library tasks should before implementation be clarified by cost-benefit analysis; especially, administrative libraries as a rule are less involved in lending activities than public libraries.
For the establishment of criteria for the economic use of data processing in administrative libraries, I would like for refer to the preceding report by Ernst Kohl[3].

Using some few examples, I would now like to demonstrate the possibilities of the STALIS information retrieval system. Let us begin with the search and the name of KAPTEYN.

You can see the tags of the title description and especially the title and the corporate entry in the original language.
Tags are constituted for all major elements of the bibliographic description; the breakdown into tags facilitates supplementations and corrections and is necessary for the construction of registers to be used for retrieval.

The confining of the search to a year of issue, in this case 1982, for the publications of an author, here SHEA, is illustrated by the following example. In the tags 59 printing instructions for additional catalogue cards have been encoded, referring to the publisher, the serial title and the second and third author of the document.

The third example shows the publications of a corporate institution for example the INTERNATIONAL LABOUR OFFICE of the year 1982.
Regional search normally is done by names of countries, here MALAWI.
You can see the title description of a yearly report of the central bank and a monthly review of the Statistical Office of Malawi.
Subject search is possible with descriptors like TECHNOLOGY TRANSFER as you can see from the next example.

The combination of subject and regional descriptors is illustrated by a search for statistical literature concerning female work in Yemen.

In the following online retrieval we propose to do searching with subjects you are invited to choose.

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IFLA
1983

I F L A 49 th Council
and General Conference Munich
Division: Special Libraries
Section: Administrative Libraries

152-ADM-3-E

ADMINISTRATIVE LIBRARIES IN A TECHNOLOGICAL WORLD:

Past present and future - a general stocktaking and definition of stand.

(3) Major developments in hardware, software and telecommunications in the field of information storage and retrieval.

b y

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The use of telecommunications in computing applications has expanded rapidly. Between 1970 and 1980 the number of terminals in use in the Federal Republic of Germany increased by a factor of 45, similar increases are common in other countries. During the same period data networks for public use appeared in all major western countries.

Due to differences in telecommunications law, data networks in the United States and Europe evolved in different ways. Standardization activities in this field will form a basis for generally available public data networks in the near future. During the eighties low cost connections to data networks will be available to the private citizen.

At the end of the sixties information storage and retrieval systems were available in a rudimentary form only. Today quite sophisticated real-time information systems are employed. As a result of progress made in dialog-processing and access methods for non-specialized users information systems have enjoyed increasing popularity.

At present research is going on in natural language processing. This will result in intelligent enduser systems for the layman.

Up to now availability of low priced fairly powerful personal computers has not had an effect in the field of information storage and retrieval. The situation will change in the next years, when disk drives and large memories become available for the average home computer.

In the future character recognition, speech processing, intelligent terminal systems and public data networks will be in the center of interest.

1.) Hardware developments

Three key factors have contributed to the development of large CPU's:

- Progress in semiconductor technology in the last 10 years has made it possible to increase the numer of logic functions on a silicon chip by a factor of 100.

- Semiconductor memories with an access time of less than 10 nsec are available.

- Techniques which allow the packing and interconnecting of large numbers of silicon chips in a very small volume have been developed.

This means that CPU's capable of performing several million operations per second can be constructed at costs which are only a fraction of the costs involved ten years ago.

Since 1970 main memories have generally been implemented using semiconductor chips. Capacities of several million characters are quite common. Disk memory with capacities up to 2000 million characters per disk drive is available. Attempts to find a replacement for electromechanical disk drives operating on purely electronic principles without moving parts (e.g. bubble memories) have not been successful.

Development of magnetic tape drives has not been very successful and apart from improving the recording density by a factor of 4 no further innovations were made. The proliferation of small computer systems has created a demand for low-cost tape storage devices and it appears that high-capacity tape cartridge devices will appear on the market soon.

In the seventies there were several attempts to market electromechanical tape library systems, but none of these were resoundingly successfull.

There is some reason to believe that storage systems using laser beam recording on thin metallic films will provide back-up storage with very high capacity.

A recent research breakthrough in magnetic recording ("vertical recording") opens the possibility of a further increase of recording density on magnetic media by another factor of 10. Therefore, the future of magnetic disk and tape systems still looks promissing.

A landmark, as far as output devices are concerned, is the appearance of electro-photographic high performance printers on the market. These devices use a laser printer system. Apart from very high printing speed they offer character sets which can be exchanged electronically and graphics. The matrix printer is by far the most popular type of slow printer in the lower price range. The ink jet printer is another type of printer that operates silently and that is capable of producing printouts in several colours.

The microprocessor, whose capacity and complexity is continually increasing has been and will continue to be a key factor in the development of hardware for terminals and small computers.

Table top computers in 1983 offer roughly the memory space and computing power of a small to medium commercial computer installation in 1970.

2.) Architecture and software

Looking back over the last 10 years it is obvious that innovations in computer architecture are just as important as the technological developments that have taken place.

At the beginning of the seventies it could already be foreseen that the increasing complexity of data processing systems would sooner or later cause serious reliability problems. The large number of components constituting a data processing installation and the certainty that this number would continue to increase was a reason for fearing that random faults would occur so frequently that the time between breakdowns would only be a few hours. This problem has been solved by means of automatic error correcting procedures. Today, for example, errors in main memory are usually corrected automatically.

While in the past computer instructions were often implemented in the hardware of the system, today almost universal use of microprogramming offers the opportunity of adding an increasing number of more powerful commands to the computer's repertoire.

Two main advantages resulted from the increase in main memory size: Larger and more complex programs could be run and computer time could be shared by a greater number of users simultaneously. This meant that the danger of an error in one program causing other programs to malfunction became more acute. Virtual addressing and protection mechanisms were introduced to solve these problems. This also allowed the control of access of the individual user to programs and data.

Multiprocessor systems were created when the demands for more computer power could no longer be satisfied by the largest processors. This involves distributing the system load among several processors which operate together in a well defined way. The main memory of the system was replaced by a memory hierarchy consisting of a small fast memory and a very large slow one. These changes resulted in a marked increase in operating speed.

In the early days of data processing the manufacturer delivered a very simple operating system, which realized a few basic functions, in addition to the hardware. Since then systems programs with several million commands have been developed. Today many of the basic functions the user requires are already provided by an operating system. This means that the user no longer has to spend as much time as he did before writing his own programs.

At first it was feared that the growth of operating system code would cause an increasing program error rate and consequently lower stability and reliability. In the meantime however new procedures for designing and implementing software systems were developed in a new branch of applied science called software engineering. This resulted in better software quality and performance. Great advances have been made in data security procedures and methods for restarting the system after faults have occured.

The cost of system software development has, in the course of time, become considerably larger than that of hardware development. For this reason payment for system software is a condition imposed by all systems suppliers. This led to the creation of a software market with strong competition between numerous software houses and the systems suppliers. Today the user ca buy ready made software packages to solve many of his problems.

3.) Telecommunications and Data Networks

Teleprocessing has existed since the inception of data processing approximately 30 years ago. The main function of teleprocessing then was allowing the user to carry out input/output operations at a location remote from the computer centre. Remote batch stations connected to dedicated lines were used for this purpose. In the late sixties video units became available and made dialog between user and system possible. This dialog was frequently effected via the telephone network. At first, because of technical limitations, the lines were connected to the CPU by means of hard-wired control units.

Teleprocessing access methods were incorporated in the operating system to make a few basic functions available to the user. The first time-sharing operating systems were introduced around 1965. Time-sharing is the allocation of a certain amount of CPU time to each user in turn. This means that, in effect, each user has the complete system at his disposal. This mode of operation is especially suitable for interactive programming and scientific applications where each user is executing his own specialized jobs. This is, however, not the case for commercial applications where many users want to run the same programs and access the same data more or less simultaneously. Computerized booking systems or systems for accessing shared data bases are applications of this kind. The approach here is the serialization of individual jobs by special systems software components. In 1970 the first TP monitors were developed to provide serialization as well as solve other problems relating to the safeguarding of data and program restart. Since then data processing has been applied to more

and more areas of commerce where a large quantity of similar, repetitive tasks have to be carried out. Over the same period of time the number of dedicated lines increased so rapidly that each group of lines had to be controlled by a satellite computer.

Private data networks were set up shortly afterwards using dedicated lines and concentrators. Today for example large airlines have networks connecting thousands of terminals all over the world.

Telecommunication laws in Europe and the United States are very different and this is why data networks in both countries have followed different lines of development. European administrations have a telecommunications monopoly and private citizens are prevented by law from setting up telecommunication systems. This means that development of remote data processing in Europe was heavily dependent on development of public networks. West Germany is typical in this respect where 45% of terminals are operated via the public telephone network. Another 40% use a public dedicated line network which was set up by the telecommunications administration in the early seventies when the rapid growth of dedicated line communication systems threatened the state monopoly. A new digital dialling network (DATEX L) has also been set up recently. A milestone in the development of public networks was marked by the introduction of EURONET at the end of the last decade. In 1980 a public packet switched network (Datex P) went into trial operation in West Germany. Table 1 gives an overview of the increasing use of data terminals in the various public networks in West Germany.

Table 1

Network termination points of various West German communication networks (Source: Deutsche Bundespost)

	1967	1970	1975	1982
Telephone networks	170	1407	13989	54561
Dedicated line networks	-	-	14168	82480
Datex networks	60	404	1419	10781
other networks	97	2447	7770	3924
Total number	327	4258	37346	151816

5 (10)

In the United States teleprocessing networks operated by the private sector and available for general use were introduced a long time ago. ARPANET, TELENET and TYMNET are typical systems of this kind. New techniques such as packet switching were tried out in these networks which, as a rule, were only available to certain user groups - research institutes or the customers of service computer centres for example. Generally speaking these networks did not offer a complete service as far as area coverage was concerned. However, because the market for high performace data processing has grown so rapidly in recent years, AT & T and other large organizations are setting up data processing networks with full area coverage. Besides transport and storage of data these networks will also perform a certain amount of data processing. Attempts are also being made to set up teleprocessing networks using satellites. The main characteristics of such systems is their high data transmission rate, which makes additional services such as picture transmission or video conferencing feasible. Because the cost of satellite ground stations is still relatively high, satellite networks are only accessible to users with considerable resources at their disposal.

During the seventies the developers of data networks in Europe lost ground to their American counterparts because they were prevented from setting up private networks. However, as the eighties approached, the situation changed as techniques used in digital dialling networks had reached such a high degree of development that they could be made subject to international standardization. After the CCITT published the X-series recommendations work started on the construction of public digital dialling networks in most European countries. In the years to come these networks will offer a range of remarkable new services, which could also be important for information and documentation centres:

a) TELETEX offers a new kind of telex service with high transmission rate and a large character set. This service is primarily intended for text communication and office automation. It will probably to some extent replace the existing telex service. The result will be the development of a new type of intelligent printer terminal which can also be used in teleprocessing. Interworking with facsimile services is in the process of international standardization.

b) PRESTEL, the VIDIOTEXT system originally developed in Britain, is now being tested in several European countries. In this system inexpensive user terminals are connected via the existing telephone network. This service has been standardized in Europe and is particularly well suited for dialog with data bases and for booking and ordering services. It can provide full area coverage for transaction processing. Experts predict that travel bookings, mail order purchases as well as other financial transactions will be possible from one's own home in the very near future. The replacement of telephone directories by very low cost terminals employing a retrieval system is an idea originating from the French Telecommunications Authorities which is worth mentioning in this context.

c) The first fully digital telephone exchanges have been operating in Great Britain since 1980 (System X). Agreement on the standardization of European digital telephone systems has been reached in discussions at CEPT. Using this system speech communication will take place at 64 Kbit/s.. Digital traffic is also possible as is the transition to other public networks. The first prototypes using these new techniques are to go into operation in Germany in 1983. It is probable that several European telecommunication authorities will start introducing Integrated Services Digital Networks (ISDN) in 1985.

   The ISDN-Standards under discussion by CEPT and CCITT will profoundly influence the technical trend in private automatic branch exchanges (PABX). After 1985, ISDN will emerge as the European standard for both public and private telephone systems. Digital communication for speech, data and pictures will use this standard.

d) Experiments on wide band communication using coaxial cables or optical fibres have been carried out all over Europe. These systems have a large bandwidth but are in general unsatisfactory for dialog traffic, as they usually have a tree structure.

e) In the latter half of this decade satellite communication will become increasingly important in Europe. Telecommunications authorities are also considering the possibility of making wideband services available to the private user.

In conclusion one can say that after several years of divergent development in Europe and the United States, the European authorities have become very active in the field of public data networks. This would lead one to expect that users will soon be able to benefit from the advantages of public networks, i.e. complete area coverage, guaranteed quality of service and standard interfaces. The increase in transmission speed will result in a considerable lowering of cost.

The variety of digital networks and transmission procedures has increased the complexity of hardware and software. Also, because of the rapid development of private networks in the USA in the mid-seventies, almost all the important manufacturers of data processing equipment have their own "network architectures", which are, in general, not mutually compatible. ISO has been trying to gain acceptance for the standardization of a reference model, which describes the functions of teleprocessing systems in terms of function layers. CEPT, CCITT and ISO have begun to publish recommendations and standards for teleprocessing systems based on this model and it is hoped that this will improve the compatibility of data processing systems in the years to come.

No technological advance mentioned previously has greater significance for teleprocessing than the microprocessor. Without the microprocessor it would not have been possible to construct intelligent terminals which have all the characteristics of a small computer system. Microprocessors are very common today in personal computers and the number of applications is increasing rapidly. In the future personal computers will be equipped with their own small data bases opening up further possibilities for the user.

4.) Information Storage and Retrieval

At the end of the sixties information storage and retrieval systems were still in a rudimentary stage of development. Higher functions could not be realized as the required CPU speeds were not available and economic problems often arose because memory costs were high. However the situation has changed dramatically in the course of the last 10 years. Modern data processing systems can effectively store a very large amount of data and are able to accomodate a large number of users simultaneously.

In the seventies the development of information storage and retrieval was determined by three factors:

- Batch processing in a computer centre was the usual mode of operation in the sixties. However 1970 saw a breakthrough in the form of on-line systems which could be used by many users in dialog operation.

- The advances made in teleprocessing and network design led to the formation of extensive information networks such as ARPANET, TYMNET or EURONET. In their turn these developments stimulated the construction of new, public switched data networks in Europe.

- While large data bases were being developed and set up for use in many areas of science and technology, an analogous application of teleprocessing to information storage and retrieval was also taking place.

To recapitulate we can say that information storage and retrieval systems have become commercially viable in recent years and that an information industry has been created which will probably be a sine qua non for future economic development.

Most commercial information storage and retrieval systems in operation today are designed using principles that were already familiar 10 years ago.This means that practically all storage and retrieval algorithms are based on Boolean logic. The conclusion that no radical change has taken place in this field over this period is inescapable. Mathematical procedures for measuring the similarity of data had already been proposed at the beginning of the seventies, however they could not be realized in practice because the demands they made on computer resources were too great. The increasing quantity of documentation which has to be stored in modern retrieval systems is one cogent reason for assuming that these methods will not find much favour in the near future.

The automatic indexing of information has not proved to be commercially viable even though several effective programs have been developed. On the other hand a commercial breakthrough in the near future is likely. Interestingly, it looks as if automatic indexing using a predefined dictionary offers better results than full text inversion.

Linguistic data processing methods have been implemented in experimental systems, but as yet no wide practical application for them has been found. Nevertheless proofs exist showing what the exact limits of such methods are. Methods of evaluating the semantic content of information will not be available in the foreseeable future.

The use of commercial data base systems has grown rapidly in the seventies and today the use of data bases is common practice. Over the last 10 years progress has resulted from research into various data models, of which the relational model has made the greatest impression. The main area of debate for experts in the field has been the standardization of data base interfaces. CODASYL was the starting point for the discussion and is supposed to facilitate the portability of user programs for various data base systems. It is worth noting that standardization was limited to data base systems as the user interfaces of information storage and retrieval systems are, in general, used in dialog operation and this meant that the standardization of programming interfaces did not seem to have the same importance. New developments in data base systems were also accompanied by greater ease of use, providing numerous aids that make life simpler for the system user whether he is an application programmer or a dialog subscriber. These aids include interactive query languages, report generators and data dictionaries. Automated data base design has simplified the complex problems encountered in this field.

Two main trends can be seen in the future development of data base technology - the implementation of extremely large data base systems and data base decentralization.

Today the problems associated with "distributed data bases" have not been fully solved. There is a need for systems in which data is stored at many locations in a computer network, furthermore all the network subscribers should be able to access and update all this data. Many limited versions of such systems have been realized, however no one has yet succeeded in designing a system that has all the characteristics of a single large data base. This would require the transfer of an extremely large amount of data between the various computers in the network which in turn would necessitate powerful CPUs. Judging by the present development of public data networks it seems likely that data transfer costs will decrease sharply and that sufficiently high transmission rates will be available in the years to come.

There are indications that the sharp distinction between retrieval and data base systems will not be viable in the future.

There is a definite need for retrieval systems with a capability to perform data base operations on the data to be retrieved. Such systems would be of particular use to libraries. They are under development and will be available soon.

Remarkable progress has been made in the field of data acquisition for information systems:
Machines can now read typewritten text at much lower cost than before. This means that devices which are capable of processing written information more efficiently than ever before will be appearing on the market soon.

Software systems which can analyse natural language could form the basis for automatic extraction of descriptors from documents. It should also be possible to build dialog systems which allow a user to communicate with data bases in a natural language. However, they will be restricted to fairly narrow fields of expertise for the forseeable future.

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Division: Special Libraries
Section: Administrative Libraries

153-ADM-4-E

Electronic Data Processing in Administrative Libraries

Opportunities, effects, and limitations

by

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to be presented orally to meeting no:
95

Abstract

Whereas general research libraries with a large staff introduce data processing primarily in order to make their book processing functions more effective, the much smaller administrative libraries with their limited resources for the provision of information should profit from data processing primarily in improving both the qualitiy and quantity of information they offer to their office. Irrespective of whether they use microcomputers or minicomputers or whether they are joint users of the mainframe computer of their administration or authority, they should, therefore, at any rate aim at terminal equipment and software to allow them both to participate in networks of libraries and documentation centres with similar fields of activity and to have access to related databases.

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The reasons for automating administrative libraries differ from the reasons for automating academic libraries or public libraries. Whereas in the latter computers are used primarily for streamlining the administrative procedures in the library, administrative libraries can profit from data processing by improving both the quantities and the quality of information they can offer to their authority or office.

Large libraries, e.g. public libraries, university libraries, and national libraries, are organized according to the principle of division of labour. Computers are mainly used to assist in the area of housekeeping, i.e. the sum total of all procedures which are necessary for the administration of the library.

They can be separated into three broad areas with three separate functional library departments as shown by FIGURE 1, viz.

- acquisition;
- cataloguing;
- circulation.

The three departments, in turn, are subdivided into divisions according to the constituent procedures of processing. Accordingly the acquisitions department consists of, for instance, an order division, an accounting division, a binding division. In the cataloguing department, apart from alphabetical and subject cataloguing, there will be offices for the duplication (reproduction) of catalogue cards and for catalogue maintenance.

In an empirical investigation into the book processing in eleven large research libraries in the Federal Republic of Germany, R. Funk[1] found out that a book had to pass between eleven and 18 stages in the course of its processing, from selection to storage in the shelves.

He ascertained the times for both the duration of the particular individual tasks of book processing and the intervals between two operations, i.e. the book waiting for being transported to the next processing stage, transport itself, and after arrival at the next stage waiting for being processed), the sum total of the former being three hours at most, while the sum total of the latter added up to an average of 160 days, i.e. to almost half a year.

Therefore, the typical arguments put forward by the large academic libraries in justification of the introduction of data processing are mainly

- a reduction of the number of processing stages, resulting in
- an acceleration of the entire process itself.

Administrative libraries, on the other hand, are much smaller. 50 % of the libraries of the Supreme Federal Authorities of the Federal Republic of Germany have a staff of less than five librarians, which means that the number of processing stages is, by necessity, smaller with the result that

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the length of time between selection and storage of the book is considerably shorter than in large research libraries. Accordingly the streamlining of administrative procedures as an argument in justification of data processing does not weigh that much.

The limitations with which small administrative libraries are faced, are different. Quite often they are not in a position to produce enough information for their authorities or offices.

To give an example. Half of the Ministerial libraries in Bonn cannot record periodical articles because they are too small. After all, a cataloguer cannot catalogue more than 4.000 items per year. But, certainly, periodical articles contain more up-to-date information than books, and their cataloguing should be an information requirement for authorities which, I presume, want to make decisions in the light of the most recent findings.

Administrative libraries offer a wider range of services to their users than the large research libraries. The users of the latter have to search for the information they need according to the principle of self-service, the research library offering its catalogues and, in addition, a choice of bibliographies. In administrative libraries the user very rarely conducts a search himself, but has the librarian search for him. The administrative librarian has always been an information mediator (or, as he recently came to be named in Germany: information broker) to his authority or office.

Information, therefore, is the fourth task of administrative libraries in addition to acquisition, cataloguing, and circulation, as shown by FIGURE 2. In my view computers should be used by administrative libraries both to assist housekeeping functions and, in particular, to improve their information capacities. To this end, an online system is necessary, designed to

- integrate acquisitions with cataloguing and circulation;
- prevent duplicate entry of data;
- make use of external services (optionally, to take part in a network or co-operative system);
- offer effective searching tools for the library's own collections;
- allow access to outside databases.

Benefits for housekeeping

Many library processes are clerical procedures like sorting, filing, and sending notices. The computer can be instructed to do these tasks or assist the librarian in doing these tasks with the result that the librarian will be released for more worthwhile work.

In the traditional library it is unavoidable that some work has to be done repeatedly. Cataloguing information, for instance, has to be produced and

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typed when a book is ordered from a bookseller, it may have to be retyped, if the book has to be claimed, it may have to be retyped once again for the accessions register, it will certainly be retyped on the catalogue card, and in an administrative library, it is very often the librarian and not the user who rewrites part of the cataloguing information every time the book is lent or reserved, and when, in the course of circulation, an overdue notice has to be sent. In a data-processing system, all information that has been entered into the system once, can be used at all successive steps. As a consequence the librarian will be relieved from much cataloguing and typing or writing of cataloguing information.

In a large library organized according to the principle of division of labour, duplication of work is often not felt by the individual librarian. In the small administrative libraries where acquisition and cataloguing may be done by the same person, he or she is much more aware of repetitive work. However, in order to really take advantage of data processing, the administrative library must be offered a system that integrates the functional areas of at least acquisition and cataloguing. Even more preferable would be the integration of circulation, too.

In the traditional library, a number of files have to be maintained:

- an order file for books ordered from a bookseller;
- an in-process file for books which have been received, but are not yet available for circulation (in administrative libraries with a very short processing time, this file is unnecessary);
- the catalogue.

The maintenance of these files, the filing and the withdrawal (from the order and in-process files) of cards, takes time as well as the fact that searches have to be made in two or three files, before a book can be ordered. With the introduction of an integrated online system, at least the order and in-process files will be abolished, because they are stored and maintained by the system. If reference and information are not organized according to the principle of self-service by the user, then the catalogue is also unnecessary to retain. If it is maintained as a card catalogue, then the computer produces as many catalogue cards as required for a bibliographic item, all of them with the appropriate headings (for main, added, and subject entries) and all cards pre-filed alphabetically.

Some library functions are performed automatically, e.g. monitoring orders and loans with the follow-up operations of claiming and sending overdue notices.

The status of any book can be determined at all time, which may also result in automatic notifications, e.g. during check in that a book is reserved by another borrower.

These savings of times add up, certainly not to the amount like in large academic and public libraries as to reduce the number of staff, but as to release librarians for work necessary but neglected in the past, in parti-

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cular according to my knowledge from the libraries of the Supreme Federal Authorities in Bonn, for documentation and information.

Benefits for reference and information

The quality of service which an administrative library can offer to its authority and, in consequence, its standing very much depend on whether it is able to supply up-to-date information, i.e. documentation of periodical articles. This postulate does not necessarily mean that the library should try to document all relevant periodicals itself. If there is a suitable documentation service in the particular field, the library should make use of it and not duplicate efforts. It should confine its documentation activity in this case to the cataloguing and indexing of those periodicals which are not covered by the particular documentation service. Quite often one finds that official publications are neglected by documentation centres.

Many documentation services are accessible as online databases. The international Aslib directory Online Bibliographic Databases[2] lists 189 databases in its second edition of 1981, covering a wide range of fields of knowledge, although the majority of all databases is concentrated in the applied sciences, pure sciences, medicine, and agriculture (in this order). The German ODIN Database Guide[3] issued by the Gesellschaft für Information und Dokumentation (GID) in 1981, lists 65 databases offered by the four German EURONET hosts

- DIMDI
  Deutsches Institut für medizinische Dokumentation und Information, Köln
  21 databases, most of them in the fields of medicine and agriculture
- FIZ Technik
  Fachinformationszentrum Technik, Frankfurt
  6 databases, all of them in the field of technical sciences
- GID
  Gesellschaft für Information und Dokumentation, Frankfurt
  11 databases in various fields, among them BIBLIO-DATA by the national bibliographic agency, the Deutsche Bibliothek
- INKA
  Informationssystem Karlsruhe
  27 databases, most of them in the applied and pure sciences

In addition there are non-EURONET databases in Germany. JURIS, the legal information system of the Federal Republic of Germany, administered by the Federal Ministry of Justice, consists of four databases, for which about 200 periodicals are indexed.

By accessing online bibliographic databases, administrative libraries increase the quantities of information they can offer. By doing so they also improve the quality of their information, because by supplying periodical articles they offer more up-to-date information. Moreover, as the periodi-

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cal articles have been indexed by subject specialists, the administrative librarian may rely on the information he or she retrieves even in case of rather specific questions.

Hardware requirements

An administrative library is not large enough to justify the installation of a mainframe computer, e.g. an IBM 30xx or a SIEMENS 7.5xx, for the exclusive use of the library.

In my view two alternatives may be contemplated:

- sharing a mainframe computer;
- using a minicomputer or a microcomputer.

If the authority runs a mainframe computer already, the administrative library may be offered to participate in using it. An administrative library may also be in a position to join other libraries or networks of libraries with a dedicated library mainframe computer.

In this case the hardware installed in the library should be an intelligent terminal system as shown by ILLUSTRATIONS 1 to 3 (courtesey of SIEMENS).

In a library of up to five librarians the terminal configuration should consist of between one and three displays, a diskette drive, and a printer. If the mainframe computer is, for instance, a SIEMENS system, as will often be found in public authorities in Germany, the terminal system should, in addition, offer the IBM 3270 emulation as communications package for host dial-up so as to allow the administrative library to access relevant databases in its own country and abroad. With the advent of videotex this capacity might be used, too. As concerns software, the terminal system should offer text editing, word processing, the generation of order forms, accounting forms, catalogue worksheets, and other various forms which, even in an automated library, are still necessary (form letter writing), mailing list management, and financial accounting as shown by FIGURES 3 and 4 (courtesy of SIEMENS).

If the administration to which the administrative library belongs has no mainframe computer itself, and if there is no chance for the administrative library to join a dedicated library network system, then it may contemplate the use of a micro- or minicomputer as an alternative. For a small library mini- and microcomputers will do in automating housekeeping functions. It is true that both the software packages for handling library activities and the storage capacity for the library's data cannot reach the size which mainframe computers offer. But does a small administrative library really need the sophisticated software of a large academic library? I will try to answer this question, when I deal with library software systems.

The hardware configuration of such a stand-alone system should consist of main storage, external storage devices (disc or diskette), one or more displays, one or more printers as required by the number of librarians who

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work with the system and communication links as shown by FIGURE 5 and ILLUSTRATIONS 4 to 7 (courtesy of NIXDORF).

In addition the system should also be used as a terminal for host dial-up. To this end a number of emulations are necessary as shown by FIGURES 6 and 7 (courtesy of NIXDORF).

Software requirements

It is a truism to say that the data-processing hardware cannot be made operational without software. For the handling of library activities by data-processing devices in an online mode special library software packages are unavoidable. The components of library software packages offered on mainframe computers, are shown by FIGURES 8 and 9 (courtesy of SIEMENS).

The software packages which large research libraries require, are voluminous. It took many years to programme them, and as a consequence, they are expensive. Each of the four library software systems used by large libraries or library networks in the Federal Republic of Germany which are shown in FIGURE 10 (the survey being not exhaustive, the software system DOBIS, for instance, is not included), has a market value of more than ten million DM.

As libraries are very much language-dependent in their services, the library software systems are not universally portable. Most of them are restricted to one mainframe computer (as shown by FIGURE 10) and to one nation or language group as users. The latter restriction is particularly due to the cataloguing rules for alphabetical and subject catalogues which differ from one language group or nation to another. A good example in illustration of this restriction is DOBIS, which was originally developed by IBM and the University Library of Dortmund. When it was to be transferred to an Anglo-American environment, at least parts of the software package had to be modified. Whereas the original programs were written to comply with the conventions of the German cataloguing rules RAK (Regeln für die alphabetische Katalogisierung) and the German bibliographic exchange format MAB1 (Maschinelles Austauschformat für Bibliotheken), they had to be adapted to the Anglo-American Cataloguing Rules and to the MARC (Machine-Readable Catalogue) exchange format. In addition, the dialog language had to be changed from German to English as well as the organization of the information on the many different displays (e.g. the lists of headings, mnemonic codes, function codes, error messages, shown by FIGURE 11).

The software packages of FIGURE 10 were devised to suit the requirements of large research libraries. If an administrative library can participate in using a mainframe computer and implement one of these systems, a high standard of library operations will be realized.

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In using a mini- or microcomputer this standard cannot be maintained for the time being. Special library software systems exist for these computers, too, e.g. the software system DOKIS of the NIXDORF computer 8860 (which illustrated one of the hardware alternatives) as shown by FIGURES 12 and 13 (courtesy of NIXDORF), or a software package called DOMESTIC[4] which claims to be largely hardware-independent and has been installed on at least two hardware systems: on a PHILIPS 857 and on an PDP 11/70. These software systems assist both library housekeeping functions and information retrieval, but is doubtful whether libraries using these systems can apply all of the sophistications of the RAK or AACR. In my view, however, a small library can certainly do without these sophistications of the alphabetical and subject cataloguing rules as long as it is capable of retrieving the information it has entered into the data-processing system, and of finding the documents themselves in the library collection. After all, almost none of the databases catalogues according to the RAK. However, if the library wants to co-operate in a network on an equal footing with other libraries which conform to higher bibliographic standards, or if it wants to issue bibliographies to be distributed nation-wide, then, of course, it must live up to the standards of the large libraries

In conclusion, I would, therefore, like to stress that an administrative library has to proceed with great caution if it decides to introduce data processing. Automation may be taken as an opportunity to improve the library's services in the fields of both information and housekeeping. But it must also be born in mind that the alternatives offered for the automation of administrative libraries must be weighed in the light of the library's future status within the library community to which it belongs.

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ISBN 3-7940-4120-8

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ISBN 0-85142-138-5

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Report-Nr. BMFT-FB-ID 82-005

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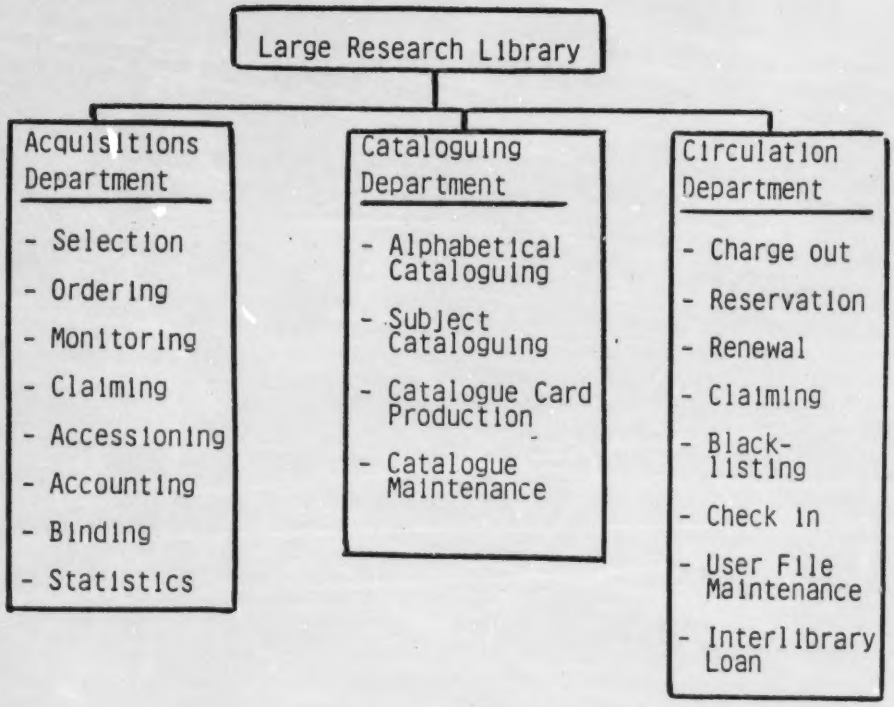

FIGURE 1

Library Functions of Large Research Libraries

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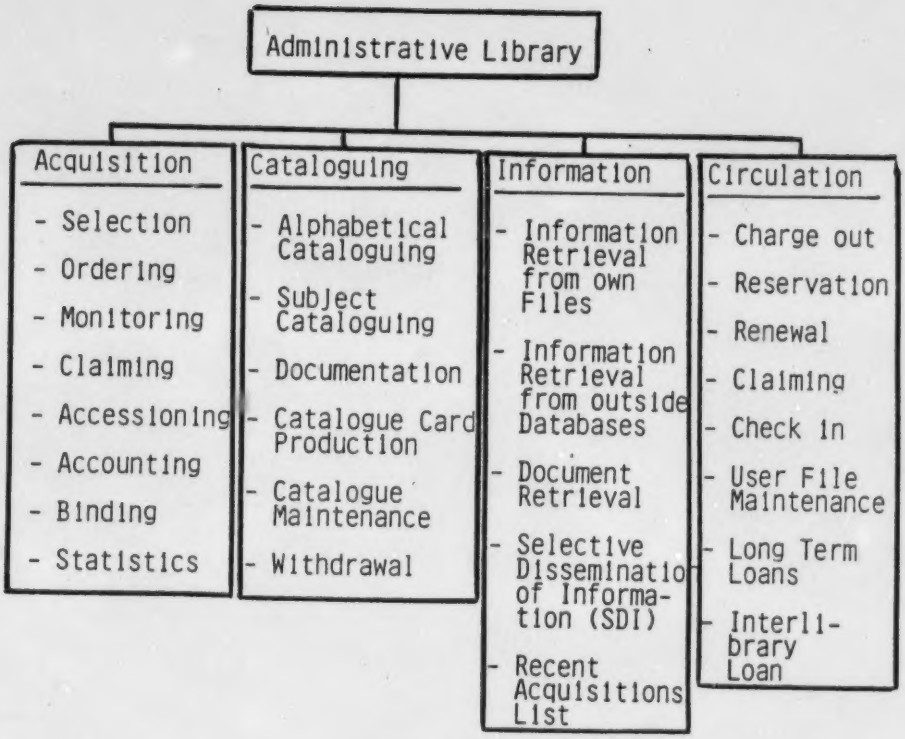

F I G U R E 2

Library Functions of Administrative Libraries

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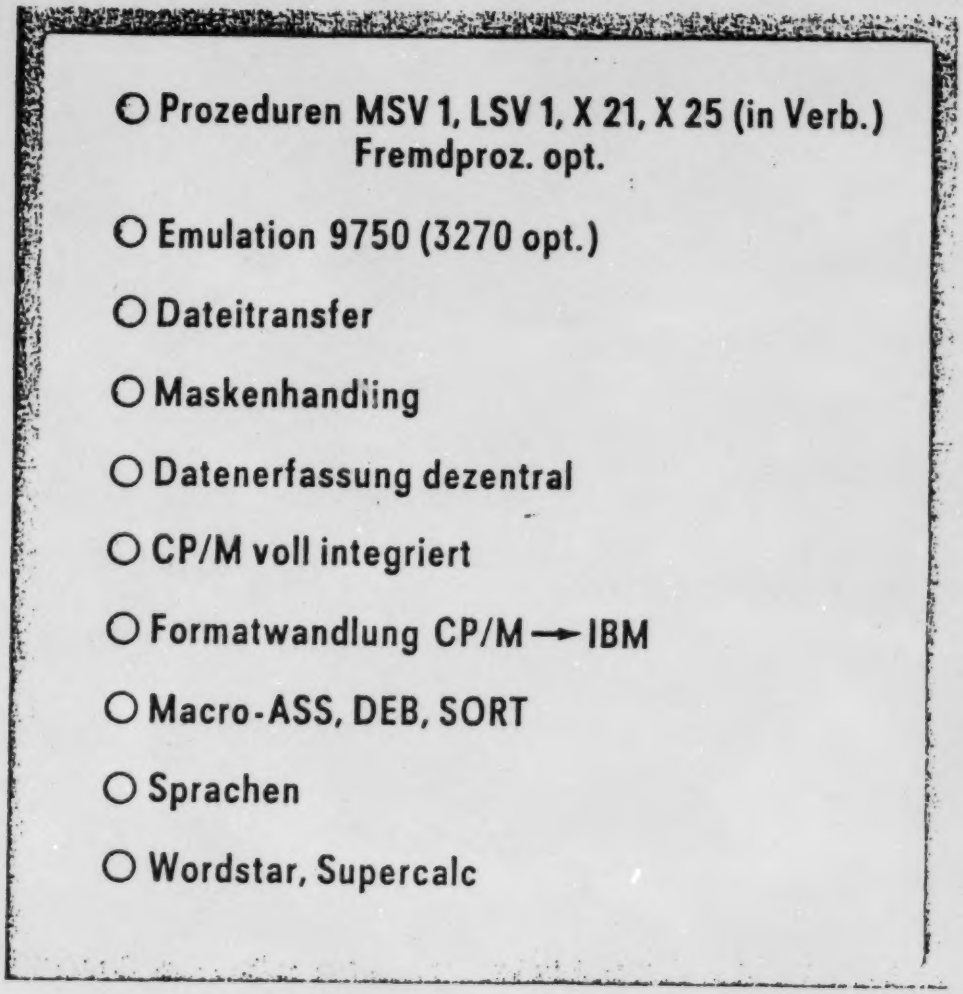

Datensichtstation 9753

FIGURE 3

Software Implementation of an Intelligent Terminal System
(Courtesy of SIEMENS)

11 (22)

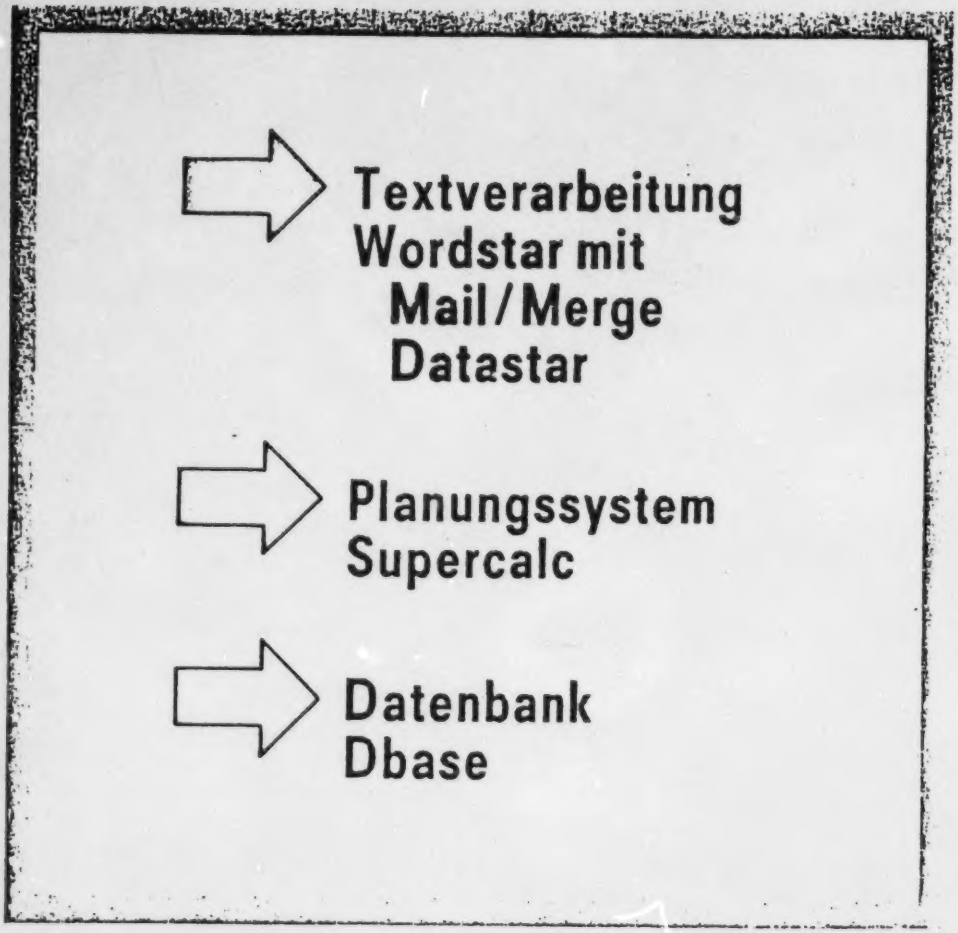

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FIGURE 4

Text-Editing, Word-Processing, and Accounting Packages
(Courtesy of SIEMENS)

12 (22)

NIXDORF
COMPUTER

Terminalsystem 8860/22

Hardware-Konfiguration

- Bildschirmarbeitsplatz (4–24)
- Terminaldrucker (4–24)
- Kommunikationsanschlüsse (4)
- Hauptspeicher 512 KB

- Externe Speicher-Peripherie
  - 1. Diskette (600 KB, Nixdorf-Format)
  - 2. Diskette (alternativ IBM-Format)
  - Festplatte in 8"-Technik (8 bzw. 16 MB)
- Nixdorf-Tastatur Standard 3270
- Zeilendrucker-Anschluß
- ID-Karten-Gerätleser

FIGURE 5

Configurations of Micro- and Minicomputers
(Courtesy of NIXDORF)

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NIXDORF COMPUTER

Informationssystem Nixdorf 8860

Kommunikationseinrichtungen

Kommunikationswege

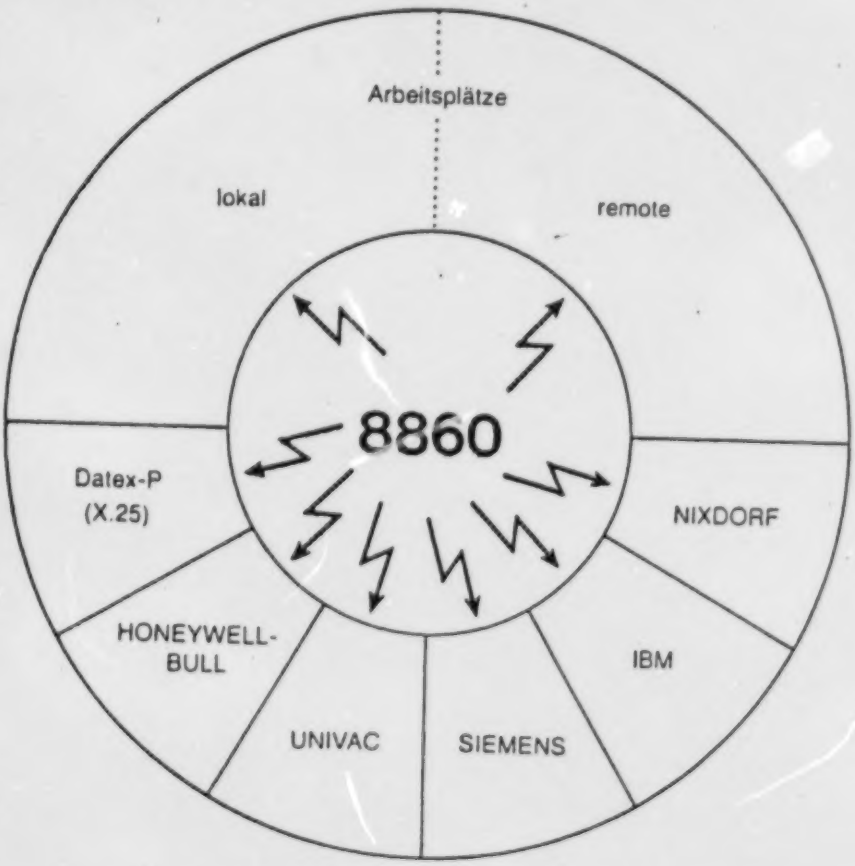

FIGURE 6

Possibilities of Host Dial-up
(Courtesy of NIXDORF)

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NIXDORF COMPUTER

Terminalsystem 8860/22

Kompatibilität in Hard- und Software

Emulationen

IBM-Emulationen

- 3270 – Dialog incl. Remote Print (BSC, SDLC, SNA)
- 3770 – RJE (SDLC, SNA)

Siemens-Emulationen

- 8160/9750 – Dialog incl. Remote Print (MSV 1/2, LSV 1/2)

UNIVAC-Emulationen

- U100/U200 – Dialog

Anschluß über DFV-Steuereinheiten

- Wählleitung (Fernsprechwählnetz, DATEX-L, DATEX-P)
- Standleitung (HfD)

Kein Umstellungsaufwand für:

- Anwendungsprogramme
- TP-Monitore
- Zugriffs-Methoden

FIGURE 7

Communication Packages (Courtesy of NIXDORF)

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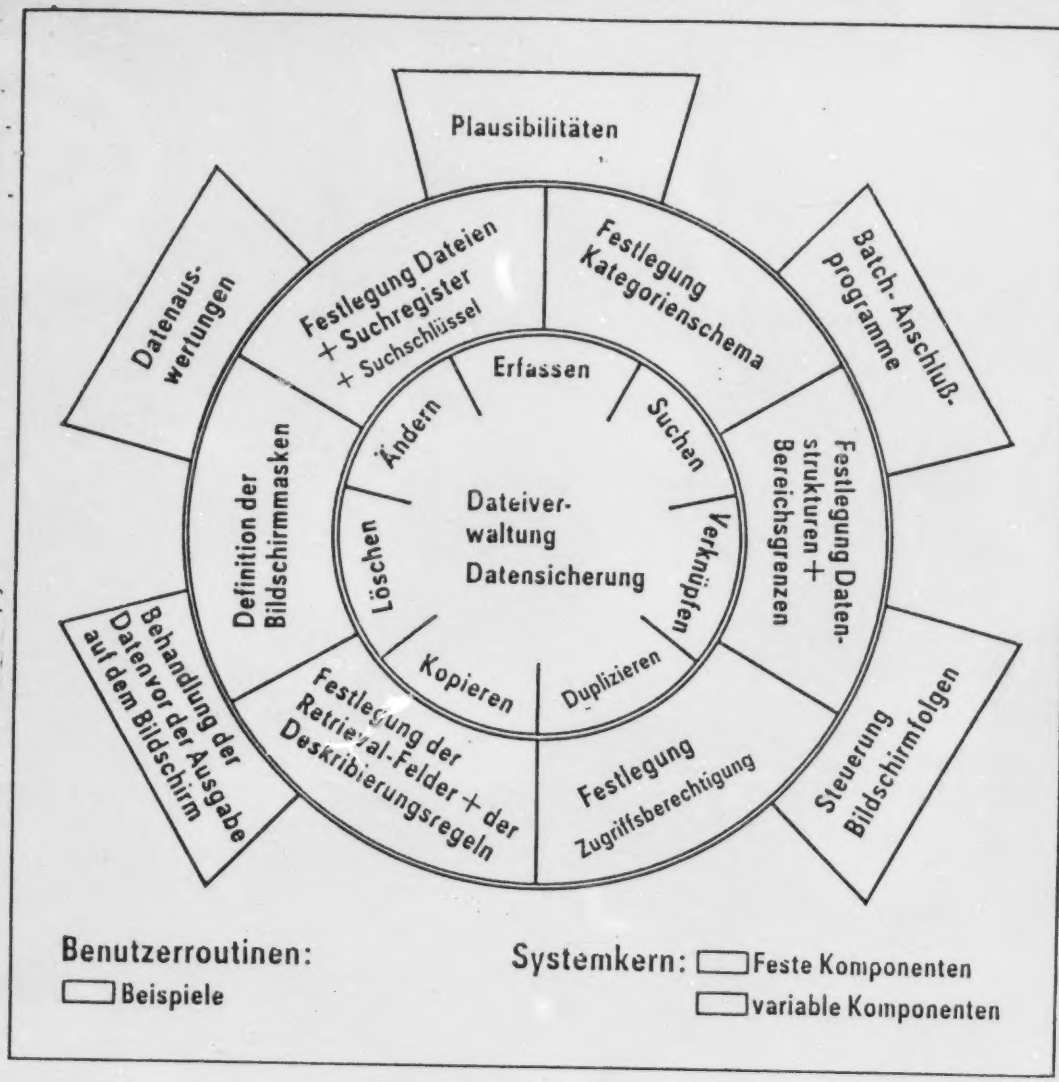

F I G U R E 8

Modules of the Library Software System BVS
(Courtesy of SIEMENS)

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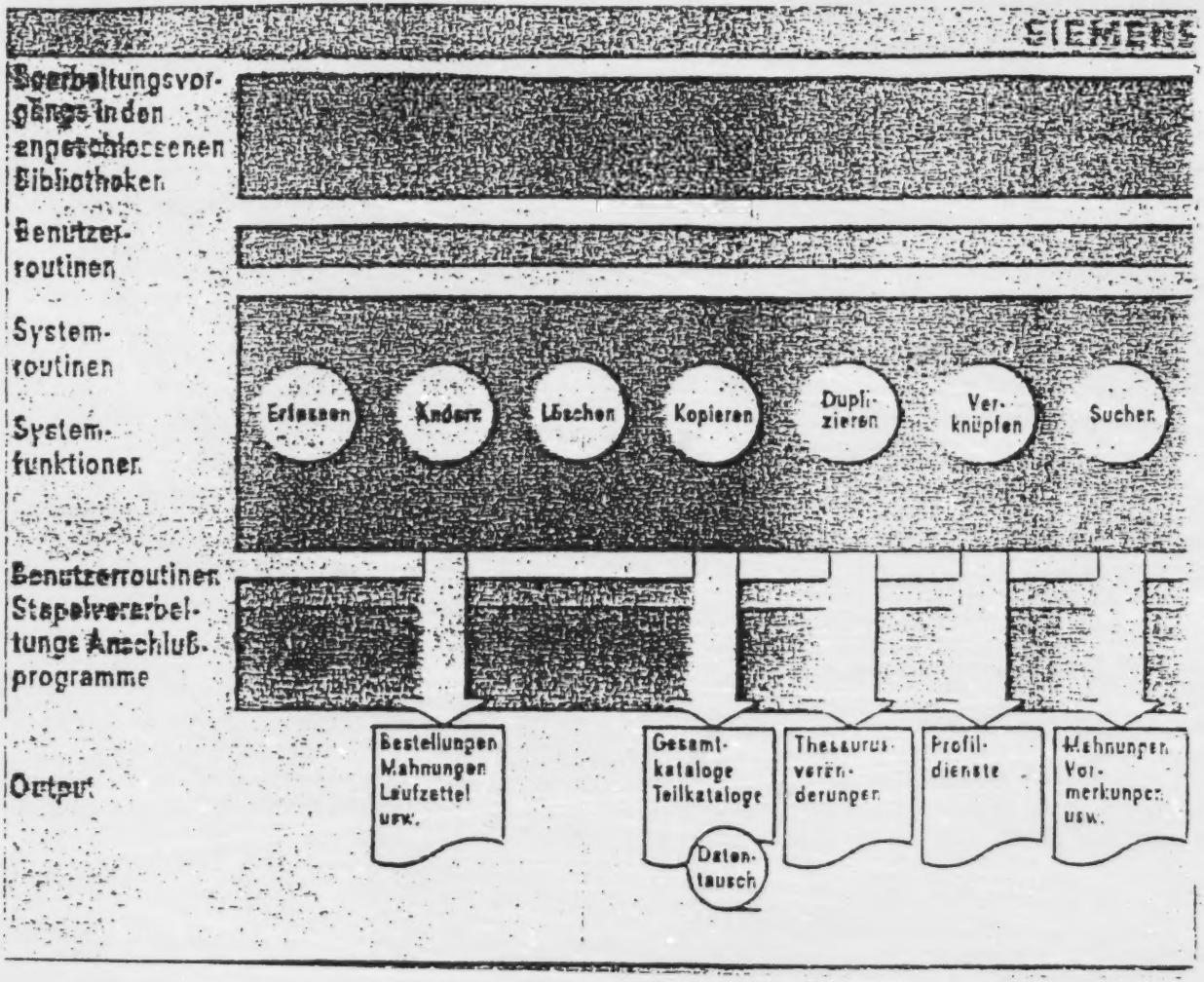

FIGURE 9

Modules of the Library Software System BVS
(Courtesy of SIEMENS)

17 (22)

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SPECIAL SOFTWARE SYSTEMS FOR ON-LINE INFORMATION AND LIBRARY NETWORKS
(as of June, 1981)

	IBAS III	BVS	HEBIS	GRIPS
Supplier	BSE Systementwicklung EDV-Beratung GmbH Berlin	SIEMENS München	Kommunales Gebietsrechenzentrum Frankfurt/Main	Deutsches Institut f. Med. Dokument. u. Information Köln
Genesis	from 1971 > 100 man-years	from 1977	1978 - 1980 43 man-years (ADABAS excluded)	from 1972 140 man-years
Hardware and operating system	IBM, DOS-VS/VSE OS SIEMENS, BS 1000 BS 2000 UNIVAC, VS9, OS3	SIEMENS, BS 1000 BS 2000	IBM, OS/VS MVS	SIEMENS, BS 2000
Programming language	ASSEMBLER	ASSEMBLER	PL/I (F compiler)	ASSEMBLER
Library functions	cataloguing indexing classification catalogue production statistics accounting (incl. prod. of delivery notes and invoices) retrieval	cataloguing indexing classification retrieval circulation (BIAS, in developm.) catalogue production with BIKAS2	cataloguing indexing exchange (both ways) catalogue production retrieval	cataloguing indexing classification retrieval SDI accounting
Standard formats (MAB1, CCL) for input, display, exchange		MAB1 (i, d)	MAB1 (i, e)	CCL (i, d)
Input and update procedures	free-format i. copying function duplication check real-time update (incl. inverted files) conversion programme (may be used to program batch input of MAB1 data) automatic linkage	pre-formatted i. copying function batch update with limited real-time u. links between records in same or diff. files to be admin. by user	pre-formatted i. copying function duplication check real-time and batch update automatic link.	pre-formatted i. real-time and batch update (batch preferred) links between records in same or different files to be admin. by user

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	IBAS III	BVS	HEBIS	GRIPS
•Retrieval functions	Boolean operators AND OR, NOT	Boolean operators AND OR, NOT descriptor relations	Boolean operators AND	Boolean operators AND OR, NOT descriptor relations qualification of search terms
	left-justified truncation (trailing pos. or with lower and upper limits)	left-justified truncation (with lower and upper limits)	left-justified truncation (trailing pos. or with lower and upper limits)	left- and right-justified truncation character masking adjacency patterns string search
		command language		command language (Common Command Language, CCL)

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FIGURE 10

Some Library Software Systems for
Online Information and Library Networks
(as of June, 1981)

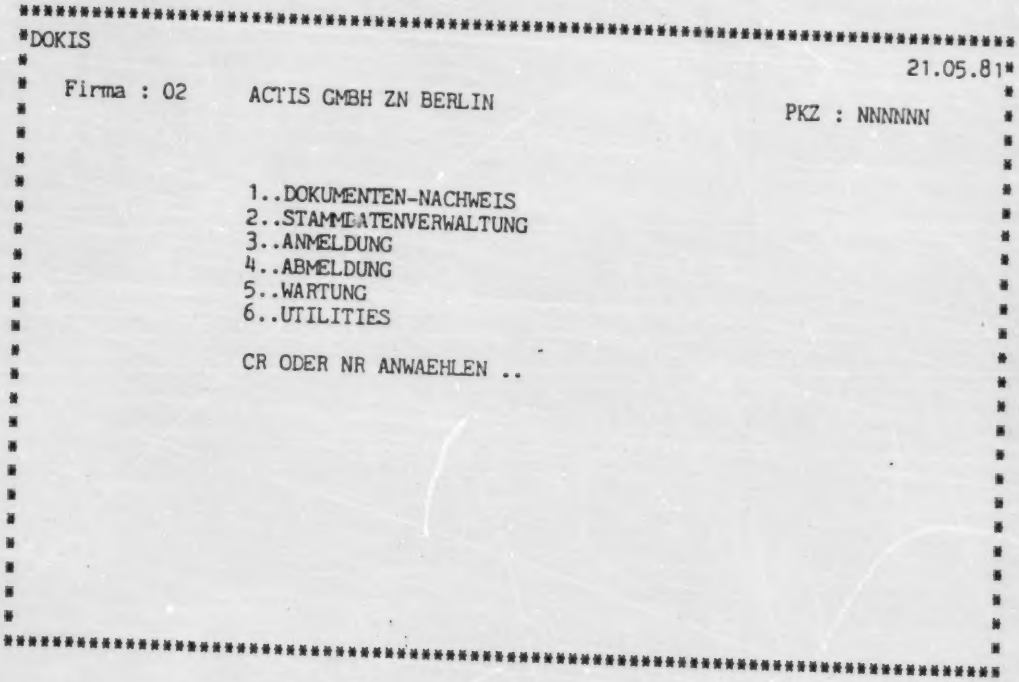

Abb. 1: Hauptmenue

FIGURE 13

DOKIS Main Functions
(Courtesy of NIXDORF)

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Division: Spezialbibliotheken
Section: Behördenbibliotheken

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Daten- und Textkommunikationsdienste der Deutschen Bundespost

1. Einleitung

Die Deutsche Bundespost als Fernmeldeverwaltung in der Bundesrepublik Deutschland bietet ihre Dienstleistungen auf dem Telekommunikationssektor an. Ihre Dienstleistungen beziehen sich auf die Sprach-, Daten- und Textkommunikation.

Von besonderem Interesse bei Ihrem Kongress ist die Anwendung der Daten- und Textkommunikation für die bibliotheksspezifischen Informations- und Dokumentationsdienste. Hier wird hauptsächlich an die computergestützte Literaturrecherche gedacht.

2. Datenkommunikationsdienste

Das Dienstleistungsangebot für die Datenkommunikation umfaßt im wesentlichen die Datenverbindungen im Telefonnetz, Direktrufnetz und im Datexnetz. Derzeit sind im Bundesgebiet etwa 160 000 Datenstationen an unsere Datennetze angeschlossen.

2.1 Datenübermittlung im Telefonnetz

Das Telefonnetz wurde schon in den 60er Jahren für Zwecke der Datenübermittlung mitverwendet. Als Zusatzeinrichtung zum Telefon ist ein Modem notwendig, siehe Abb. 2.1.

Die Datenübertragungsgeschwindigkeiten bei serieller Übertragung reichen von 200 - 4800 bit/s. Die meisten Anwendungen erfolgen im Dialogverkehr mit wechselnden Partnern bei kleinen Datenmengen. Die parallele Datenübermittlung mit 10 - 40 Z/s wird bei Bestellsystemen im Pharmahandel oder im Buchhandel eingesetzt. Derzeit arbeiten etwa 60 000 Datenstationen über das Telefonnetz.

Vorteilhaft an der Datenübermittlung per Telefon ist die weite Verbreitung des Telefons. Von Nachteil sind die begrenzten Übertragungsgeschwindigkeiten, die Fehlerhäufigkeit und die lange Verbindungsaufbauzeit im Telefonnetz. Deshalb hat man für die Datenübermittlung eigene Datennetze entwickelt.

2.2 Datenübermittlung im Direktrufnetz

Im ersten dieser speziellen Datennetze, dem Direktrufnetz, werden heute gut die Hälfte aller Datenverbindungen abgewickelt, siehe Abb. 2.2. Direktrufverbindungen verlaufen über fest geschaltete Leitungen. Der Teilnehmer nutzt seine Leitung ausschließlich für sich allein. Übertragungsgeschwindigkeiten von 50 - 48 000 bit/s. Die mtl. Verkehrsgebühren sind abhängig von der Entfernung der Datenstationen und der gewählten Geschwindigkeitsklasse. Es handelt sich hier um einen Pauschaltarif unabhängig von der übermittelten Datenmenge. Wir werden in Zukunft diesen Pauschaltarif durch einen nutzungszeitabhängigen Tarif ersetzen.

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Ein Beispiel für die Anwendung einer computergestützten Literaturrecherche mittels Datenübertragung im Telefon- und im Direktrufnetz ist in Abb. 2.3 dargestellt. Über das Telefonnetz wird ein Netzknoten angewählt, der im Direktrufnetz mit dem Datenbankbetreiber verbunden ist. Bei dieser Lösung trägt der Anwender nur die Telefongebühren, während die Kosten für die weitere Direktrufverbindung vom Datenbankbetreiber zu bezahlen sind. Durch diese Konfiguration lassen sich viele Anwendungsfälle konzentrieren.

2.3 Datenübermittlung im Datex-Netz

Speziell für die Datenkommunikation über Wählverbindungen ist das Datexnetz mit z. Z. über 12 000 Datenstationen geschaffen worden. Hier gibt es 2 Varianten: Das leitungsvermittelte Datex-L-Netz und das paketvermittelte Datex-P-Netz.

Beim Datex-L-Netz baut der rufende Tln eine physikalische Verbindung - eine Leitung - zum Empfänger auf. Die Vermittlungseinrichtung der Post schaltet diese Verbindung durch und sie bleibt so lange bestehen, bis der rufende Tln auslöst, siehe auch Abb. 2.4. Der Geschwindigkeitsbereich reicht von 50 - 9600 bit/s, demnächst sind 64 000 bit/s möglich. Genutzt wird dieser Dienst von Banken, Service-Rechenzentren, Bausparkassen und Reisebüros. Internationale Verbindungsmöglichkeiten sind aus Abb. 2.5 ersichtlich.

Beim paketvermittelten Datex-Dienst werden die Daten nicht über eine physikalische Leitung, sondern über eine sog. virtuelle Verbindung transportiert. Dabei werden die Daten jeweils zu Datenpaketen zusammengefaßt, mit einer Adresse versehen und mit hoher Geschwindigkeit durch das Netz transportiert, siehe Abb. 2.6. Die Übertragungsgeschwindigkeiten liegen zwischen 300 und 48 000 bit/s. Ein wesentlicher Vorzug des Datex-P-Dienstes ist es, daß auch Geräte verschiedener Geschwindigkeitsklassen miteinander korrespondieren können.

Der Datex-P-Dienst bietet der Anwender die Basis für eine kompatible Datenübermittlung. An Zugangsmöglichkeiten zum Datex-P-Netz gibt es mehrere Varianten, siehe auch Abb. 2.7.

1. Der direkte Zugang für paketorientierte Datenstationen (Datex-P 10-Hauptanschluß.

2. Der Zugang über eine Anpassungsfunktion (PAD: packet assembly disassembly) für zeichenorientierte Datenstationen oder für Datenstationen, die über andere Fernmeldenetze angeschlossen sind.

Die internationalen Verkehrsbeziehungen über das Datex-P-Netz sind in Abb. 2.8 dargestellt. Für das Bibliothekswesen sind vor allem die Verkehrsbeziehungen zum Euronet und zu den Datennetzen Telenet und Tymnet von Interesse. Abb. 2.9 zeigt eine Anwendung eines Datex-P 10-Hauptanschlusses für die computergestützte Literaturrecherche.

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3. Textkommunikationsdienste

3.1 Telexdienst

Für die Textübertragung kleinerer Texte bietet sich der allbekannte Fernschreib- oder Telexdienst an. In Deutschland sind etwa 160 000 Fernschreibanschlüsse z. Z. installiert. Die Übertragung einer Schreibmaschinenseite von etwa 2 000 Zeichen dauert ca. 5 Minuten lang. Trotz der techn. gesehen langsamen Übertragungsgeschwindigkeit ist dieser Dienst für den Kurznachrichtenaustausch gut geeignet, nicht zuletzt wegen seiner weltweiten Verbreitung. Wie Abb. 3.1 zeigt, kann man den Fernschreiber auch zur Übertragung von Daten zu einer Datenverarbeitungsanlage einsetzen.

Wesentlicher Vorteil heutiger Fernschreiber ist ihr niedriger Lärmpegel. Die Firmen werben für ihre flüsterleisen Maschinen. Man braucht den Fernschreiber nicht mehr in ein zentrales Fernschreibbüro zu verbannen, man stellt den Fernschreiber heute einfach ins Büro. Alle Anstrengungen, den Fernschreibdienst zu verbessern, führen konsequent zu unserem neuesten Textübertragungsdienst, dem Teletexdienst.

3.2 Teletexdienst

Teletex - auch Bürofernschreiben genannt - verknüpft elektronische Schreibmaschinen oder Textsysteme miteinander. Eine Teletexmaschine ist Schreibmaschine und elektronischer Briefkasten zugleich. Im Elektronentempo wird ein im Büro geschriebener Brief direkt in das Büro des Empfängers übertragen und dort ausgedruckt. In weniger als 10 Sekunden ist Ihr Brief genauso sauber und fehlerfrei von hier aus in Hamburg als wenn er mit der Maschine geschrieben und mit der Briefpost zugestellt worden wäre. Nur eben viel schneller.

Unabhängig von einer Textübertragung kann man das Teletex-Endgerät auch als normale Schreibmaschine verwenden, die dem Benutzer auch Korrigier- und Redigierfunktionen ermöglicht. Es wird der volle Zeichenvorrat einer Schreibmaschine geboten.

Im Vergleich zum Fernschreibnetz ist die Übertragungsgeschwindigkeit im Teletexnetz über 50 mal schneller. Trotzdem ist auch eine Textübertragung vom Teletexendgerät zu einem Fernschreiber und umgekehrt möglich. Dies geschieht mit Hilfe einer besonderen Umsetzereinrichtung im Netz. Teletex ist also kompatibel mit Telex. Freilich kann man dann bei einer Textübertragung vom Teletex- zum Telexnetz eben nur die eingeschränkten Leistungsmerkmale des Telexnetzes nutzen, also z. B. nur die Kleinschreibung. Gerade aber die Kompatibilität mit Telex zusammen mit der Funktion des elektronischen Briefkastens lassen Anwendungen im Bibliotheksbereich erkennen. Zudem ist auch Teletex international möglich, so z. B. nach Österreich und nach Kanada. Zusammenfassend kann man sagen, Teletex ist geeignet für Kunden, die viel Korrespondenz erledigen müssen, die Texte bearbeiten und weitergeben und an einem schnellen und preiswerten Textaustausch interessiert sind. 3 000 Kunden nutzen derzeit Teletex in Deutschland.

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3.3 Telefaxdienst

Die heute gebräuchlichen Telekommunikationsmittel sind das Telefon und der Fernschreiber, aber nicht alles, was sich durch Sprache sagen und mit Fernschreibzeichen übermitteln läßt, reicht aus, um für den Partner verständlich und eindeutig zu sein. Vieles muß einfach abgebildet werden: Dokumente, Zeichnungen, Illustrationen oder handschriftliche Korrekturen. Und wieder anderes ist so dringlich, daß es gleich an Ort und Stelle zur Verfügung sein sollte.

Der Telefaxdienst oder das Fernkopieren schließt diese Lücke. Eine Telefaxverbindung wird über das Telefonnetz hergestellt. Als Endeinrichtungen dienen Fernkopierer, die an Telefonanschlüsse angeschaltet werden. Der Telefaxdienst basiert auf dem Verfahren der Faksimileübertragung. Er ermöglicht die schnelle Übermittlung von Schwarz-Weiß-Vorlagen soweit das Telefon reicht. Beim Empfänger liegt Minuten später sogleich eine originalgetreue Kopie vor. Auf diese Weise können auch Texte übermittelt werden. Die eingeführten Fernkopiergeräte brauchen für die Übertragung einer DIN-A-4-Seite in der Regel 3 Minuten. Neuere Geräte, die seit diesem Jahr im Einsatz sind, übertragen die Seite in einer Minute. Diese neuen Geräte sparen Fernmeldegebühren, ihre Anschaffungskosten sind dafür aber höher.

Wir sind der Überzeugung, daß mit wachsenden Teilnehmerzahlen die Gerätepreise sinken werden. Derzeit sind über 12 000 Fernkopierer im Einsatz und wir sind sicher, daß der Telefaxdienst mit seinen international genormten Merkmalen in Zukunft eine breite Basis findet.

3.4 Bildschirmtext

Bildschirmtext ist ein interaktiver Kommunikationsdienst. Er dient dem wechselseitigen Nachrichtenaustausch im privaten wie im geschäftlichen Bereich.

Das techn. einfache wie wirkungsvolle Konzept verwendet als Dialogstation im privaten Bereich das häusliche Fernsehgerät mit, das lediglich durch einen Modem und einen Decoder ergänzt wird. Über die normale Telefonleitung ist der Tln mit der Bildschirmtextzentrale verbunden, siehe Abb. 3.2. Bildschirmtext wird künftig über eine besondere Rufnummer in jedem Ortsnetz zur Ortsgesprächsgebühr erreichbar sein.

Die Bildschirmtextversuche in Berlin und Düsseldorf laufen seit nunmehr 2 Jahren. Etwa 8 000 Teilnehmer nutzen versuchsweise Bildschirmtext, davon 4 500 privat und etwa 3 500 gewerblich wie privat. Etwa 2 000 Informationsanbieter halten in den Bildschirmtextzentralen Informationsseiten parat.

Neben dem Abruf dieser Informationsseiten, die im öffentlichen Btx-System der Post abgelegt sind, wurde die Möglichkeit geschaffen, externe Rechner anzuschließen und dadurch Btx zum Zubringerdienst für die Datenverarbeitung erweitert, nämlich für Buchungen, Bestellungen oder Kontoführungen. Gerade im Bibliotheksbereich scheint ein großes Anwendungsfeld für die Abfrage aus externen Rechnern zu liegen. Schon 120 Anbieter haben ihre eigenen Rechner an das Btx-Netz angeschlossen. D. h., ein Btx-Teilnehmer hat die Möglichkeit, über sein Fernsehgerät Informationen von der Btx-Zentrale direkt abzurufen oder über das Netz mit einem externen Rechner verbunden zu werden. Hauptsächliche Anwendungsgebiete für externe Rechner liegen im Bereich des Bankgeschäftes und des Versandhandels. Schon heute werden im Versuchsgebiet bei 5 Geldinstituten insgesamt 3 000 Girokonten über Btx geführt und das Bestellvolumen bei den Versandhäusern schätzt man auf etwa 10 Millionen DM.

Das Btx-Netz ist hierarchisch aufgebaut; es handelt sich um ein 3stufiges, dezentrales Rechnerkonzept der Fa. IBM, siehe Abb. 3.3. Eine Leitzentrale steuert das Btx-Netz. Hier befinden sich alle im Btx-System benötigten Informationen im Original, z. B. alle Btx-Seiten und alle Teilnehmerdaten. Den Dialog mit den Btx-Tln übernehmen regionale Btx-B-Vermittlungsstellen, die mit der Leitzentrale verbunden sind. Auch die Verbindungen zu den externen Rechnern werden über diese Btx-B-Vermittlungsstellen geschaltet.

Nach einem ausgeklügelten System verfügen diese dezentralen Btx-Vermittlungsstellen über die Informationsseiten, die am häufigsten abgerufen werden. Auf diese Weise kann man die Speicherkapazität der Rechner optimieren und nur die Seiten dezentral vorhalten, die auch mit entsprechender Wahrscheinlichkeit abgerufen werden.

Die Btx-Tln erreichen über das Telefonnetz die Btx-B-Vermittlungsstelle.

Informationsanbieter offerieren ihre Leistungen auf unterschiedliche Weise:

1. Durch Ablage ihrer Seiten im Btx-System der DBP oder

2. über die externen Rechner, die über das Datex-P-Netz mit dem Btx-Netz verbunden sind.

Durch dieses Konzept und durch die Standardisierung von Grundfunktionen ist es möglich, von einem einfachen Bildschirmgerät aus Verbindungen zu beliebigen Datenverarbeitungsanlagen aufzunehmen.

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Btx ist keine ausschließlich deutsche Entwicklung. Im Rahmen der Videotex-Aktivitäten wird Btx weltweit erprobt und in vielen Ländern eingeführt. Btx heißt draußen so z. B. Prestel, Viewdata, Teletel oder Telidon. Geht man davon aus, daß die techn. Standards zwischen den einzelnen nationalen Btx-Systemen vereinheitlicht werden können, so ist Btx als internationale Dienstleistung denkbar. Ein wesentlicher Schritt in diese Richtung ist der neue CEPT-Standard, der auf europäischer Ebene festgelegt wurde. Damit wird von unserem Btx-Netz aus auch der Zugang zu ausländischen Btx-Systemen und ausländischen Datenbanken ermöglicht.

Der neue CEPT-Standard bietet einen erweiterten Zeichenvorrat von 335 Zeichen. Für eine verbesserte grafische Darstellung sorgen 90 zusätzliche feste Graphikzeichen. 94 unterschiedliche frei definierbare Zeichen können vom Anbieter festgelegt und benutzt werden. Anstelle der 7 Farben und weiß sind jetzt 32 verschiedene Farben innerhalb einer Btx-Seite möglich.

Das Btx-Informationsangebot gliedert sich im wesentlichen in Angebote für

- alle Teilnehmer z. B. Nachrichten, Wetterbericht, Abfrage aus einem Bibliothekskatalog

- bestimmte Teilnehmergruppen (z. B. Informationen für Ärzte, Rechtsanwälte, Verlagshäuser oder auch Archive und Bibliotheken)

- Einzelpersonen (Briefkasten als Mitteilungsdienst)

- den Dialog mit dem Rechner (z. B. Warenbestellung, Bankgeschäft, computergestützte Literaturrecherche).

Mit unserem Vorführgerät werden wir Ihnen die z. Z. im Btx vorhandenen Informationsseiten später vorführen können.

Mit zum Erfolg von Bildschirmtext als der "Datenverarbeitung des kleinen Mannes" werden die günstigen Kosten beitragen. Der Tln benötigt neben seinem normalen Fernsehgerät einen Decoder, der etwa 1 000 DM kosten wird. Man rechnet damit, daß die Decoderkosten bei entsprechender Stückzahl auf 300 DM fallen werden. Weiter benötigt der Tln eine Fernbedienung oder eine Tastatur um den Bildschirmdialog durchzuführen. Für den Bildschirmtextmodem (die Btx-Anschlußbox) ist eine mtl. Gebühr von 8,-- DM zu bezahlen.

Die Informationen sind entweder kostenlos oder entgeltpflichtig. Auf den Informationsseiten ist vermerkt, welches Entgelt zu bezahlen ist. Den Bildschirmtextdialog führt der Tln immer zur Nahgesprächsgebühr: Also für 23 Pfennig 8 oder 12 Minuten lang.

Nun zur Einführung des Systems. Ab Mai 1984 soll die hier vorgestellte Btx-Technik zur Verfügung stehen. Übergangsweise wird in Berlin eine Btx-Zentrale im CEPT-Standard errichtet. Diese umfaßt zwar voll den neuen Darstellungsstandard, sie ermöglicht aber nur einen eingeschränkten Dienst. So können ab September 1983 etwa 5 000 Tln mit Btx-Geräten nach dem neuen Standard die CEPT-Zentale in Berlin erreichen.

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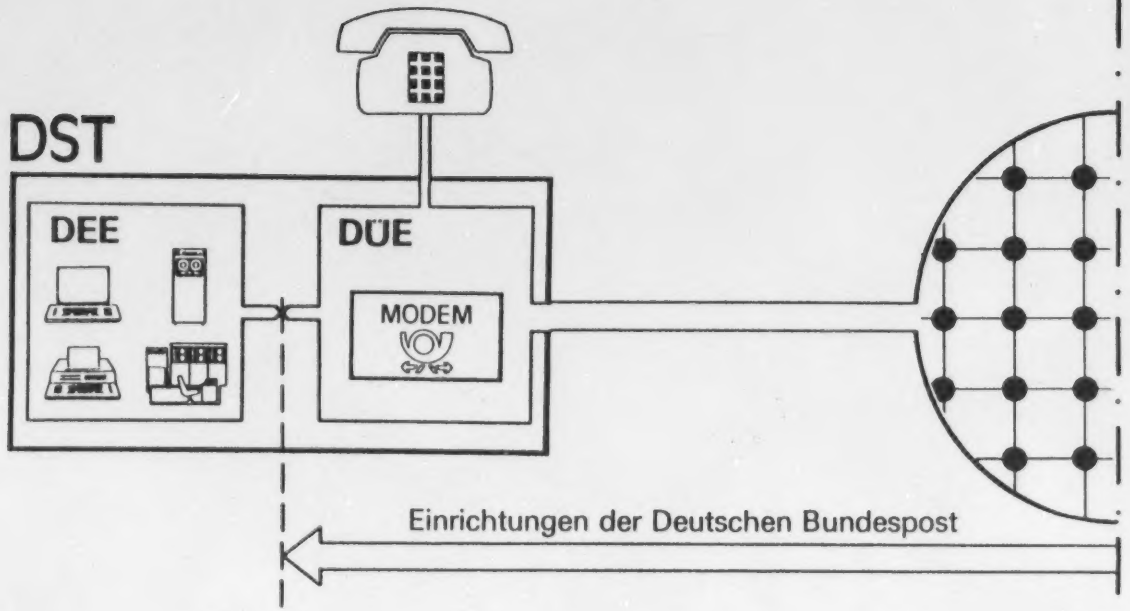
Datenübertragung im Telefonnetz

Grundkonfiguration



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DATELDIENSTE

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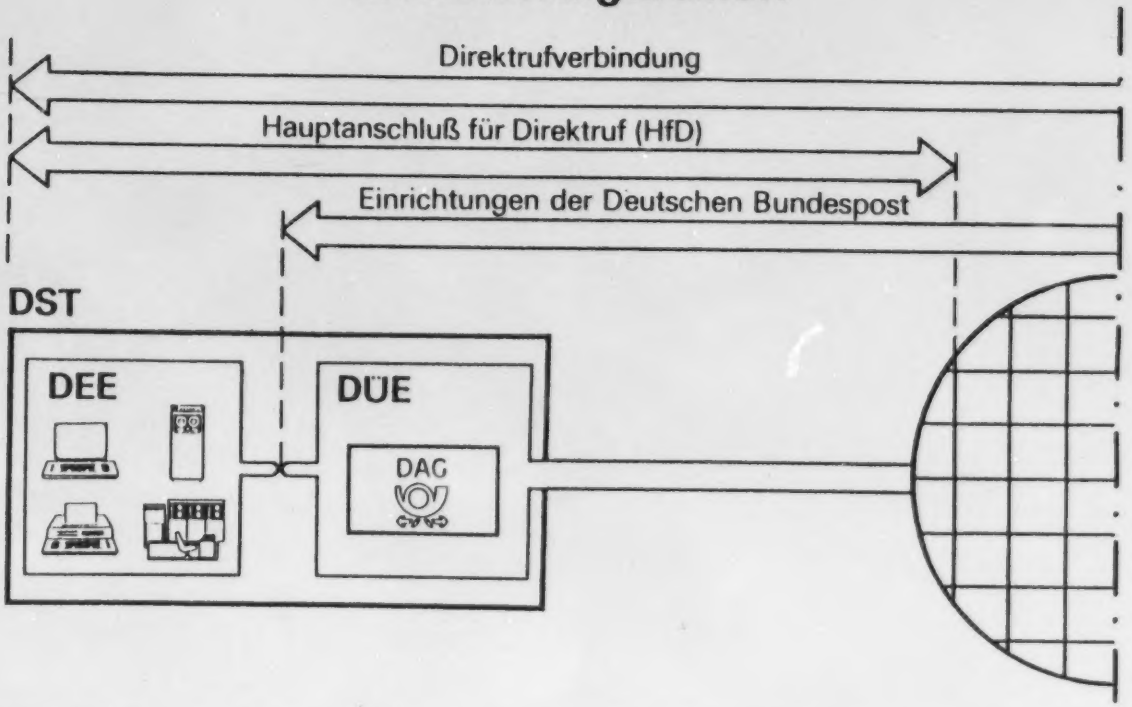
Direktrufnetz

Grundkonfiguration



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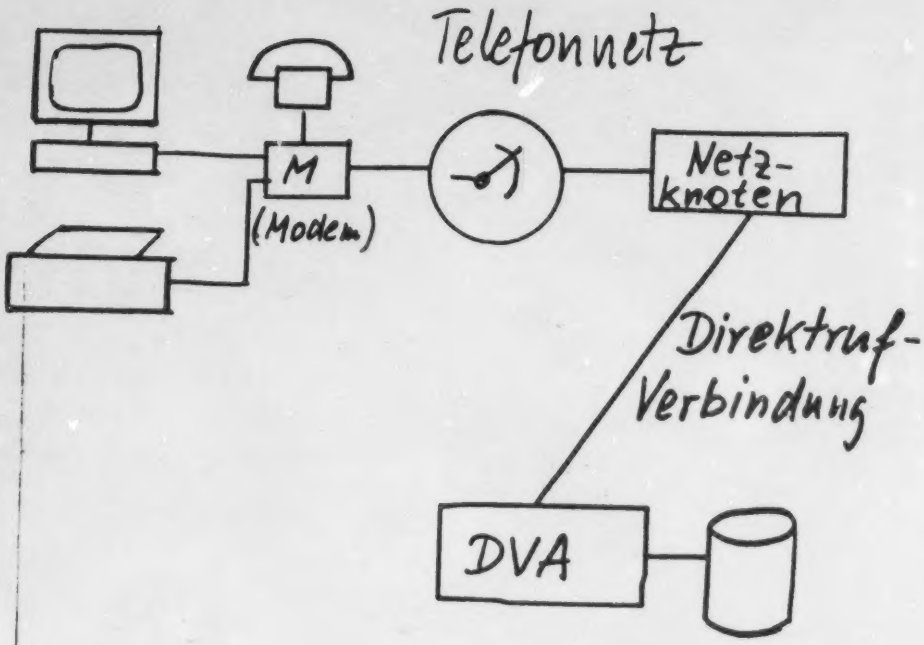
DATELDIENSTE



Computergestützte Recherche mittels einer Datenverbindung über das Telefon- und Direktrufnetz

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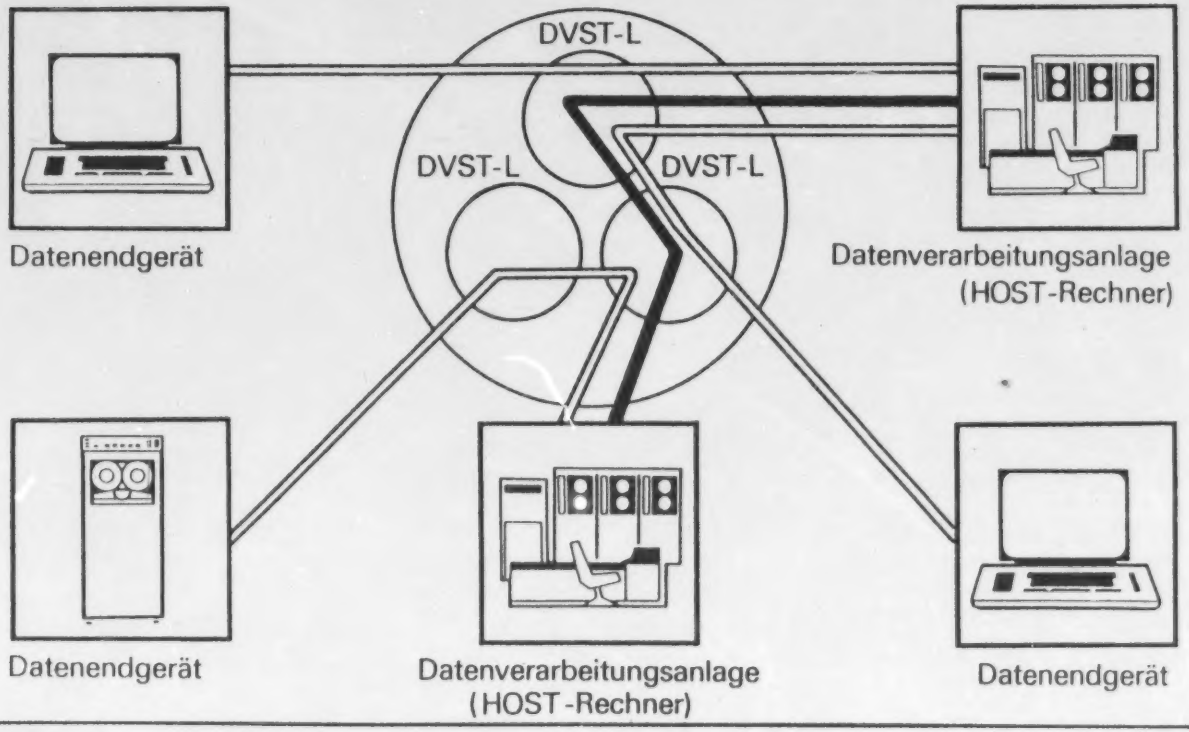
Schema des DATEX-L-Netzes

DVST-L = Datenvermittlungsstelle mit Leitungsvermittlung



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DATEX-L

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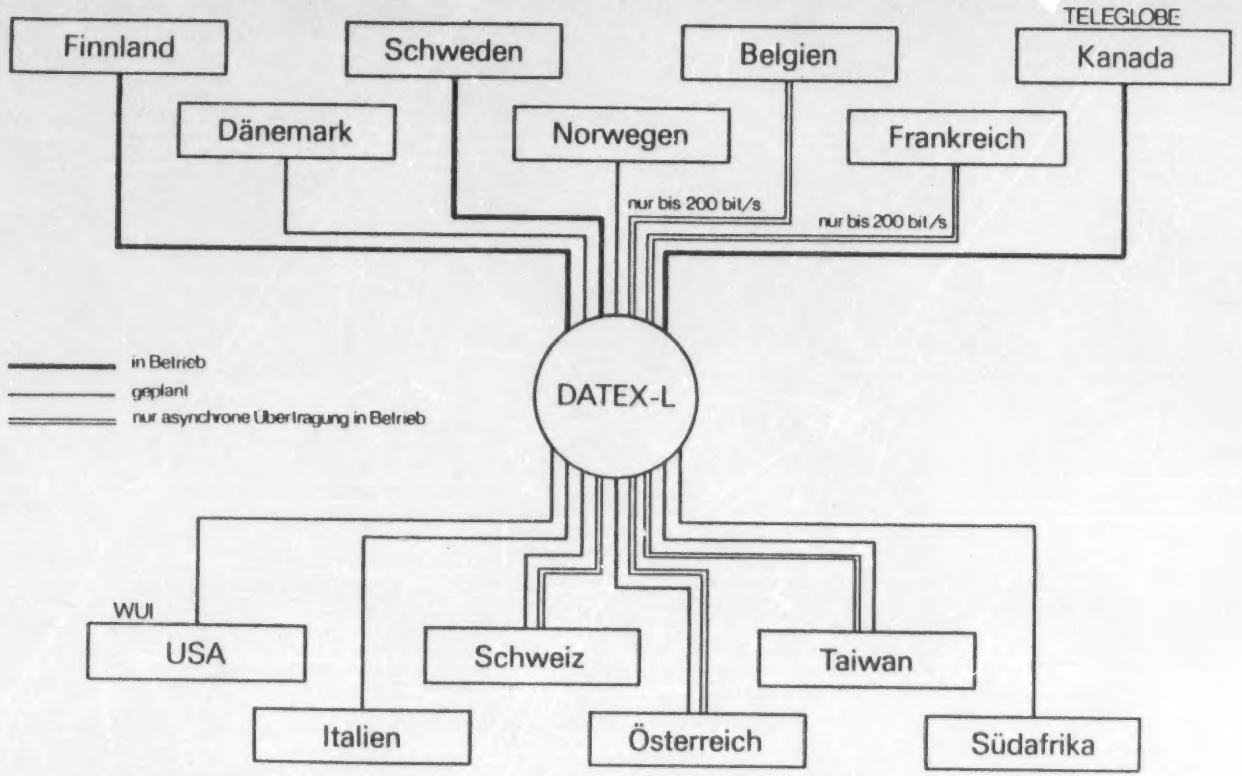
Internationale Verkehrsbeziehungen



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DATEX-L

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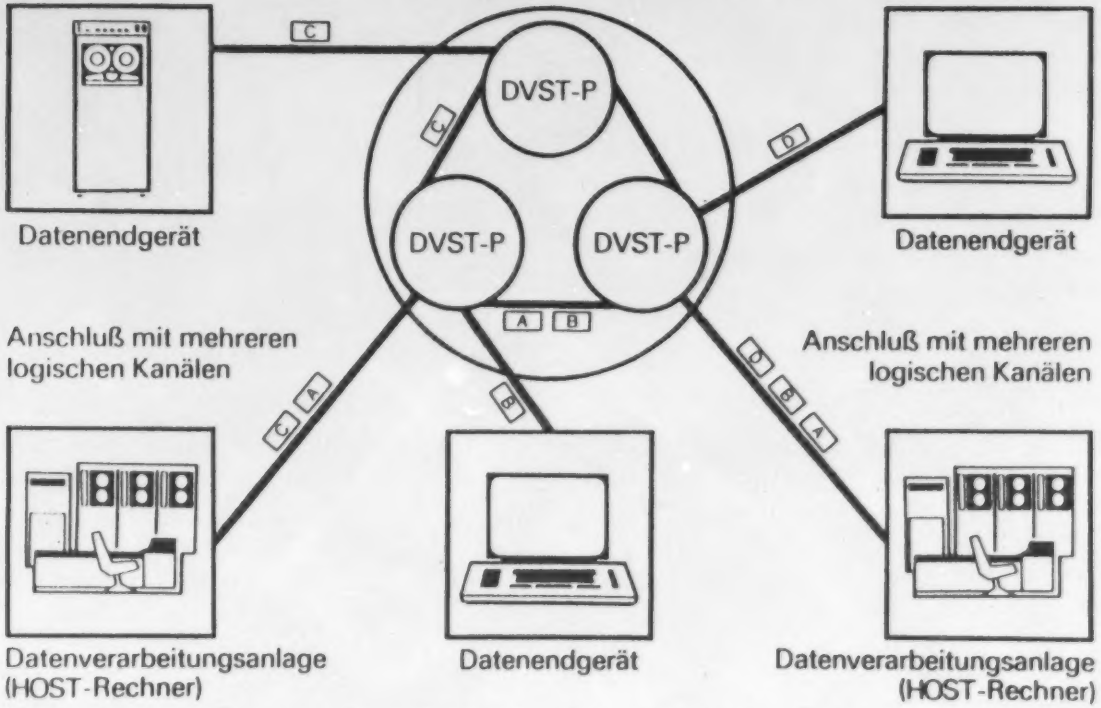
Schema des DATEX-P-Netzes



DVST-P = Datenvermittlungsstelle mit Paketvermittlung X = Paket der virtuellen Verbindung X

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DATEX-P

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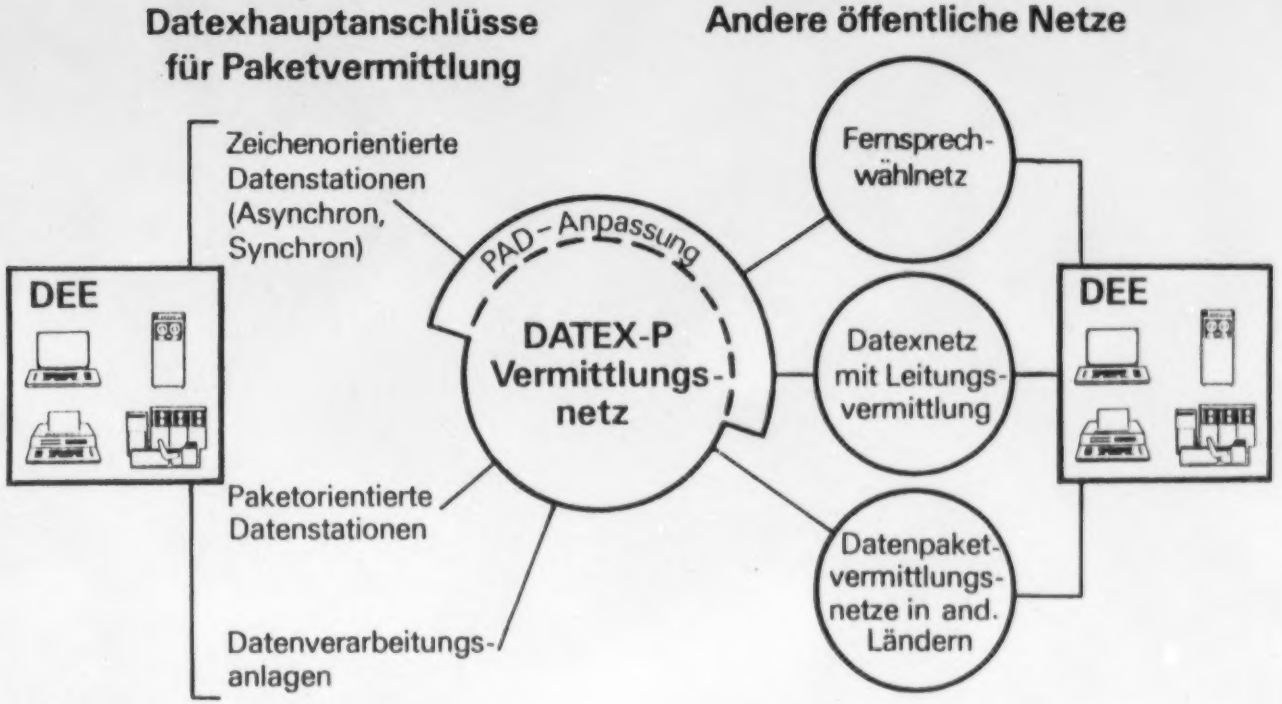
Zugangsmöglichkeiten



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DATEX-P

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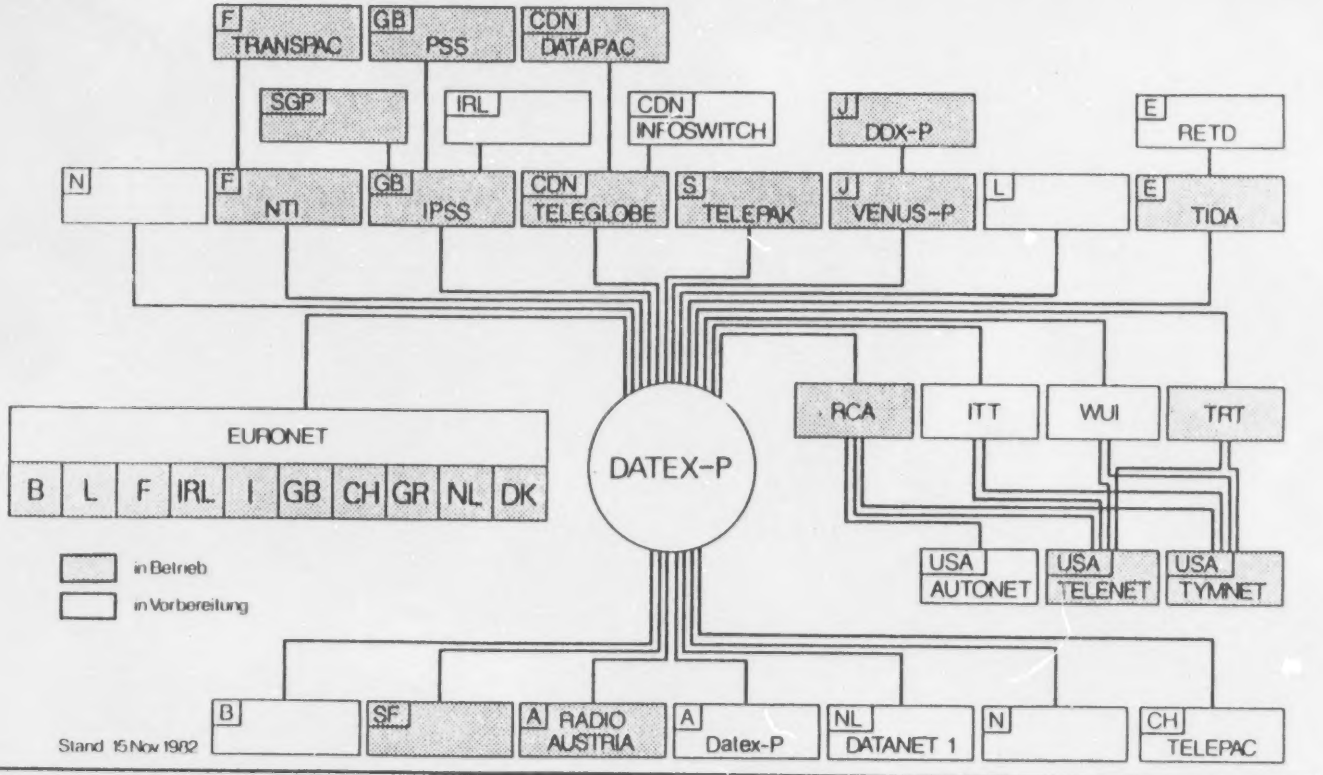
Internationale Verkehrsbeziehungen



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DATEX-P

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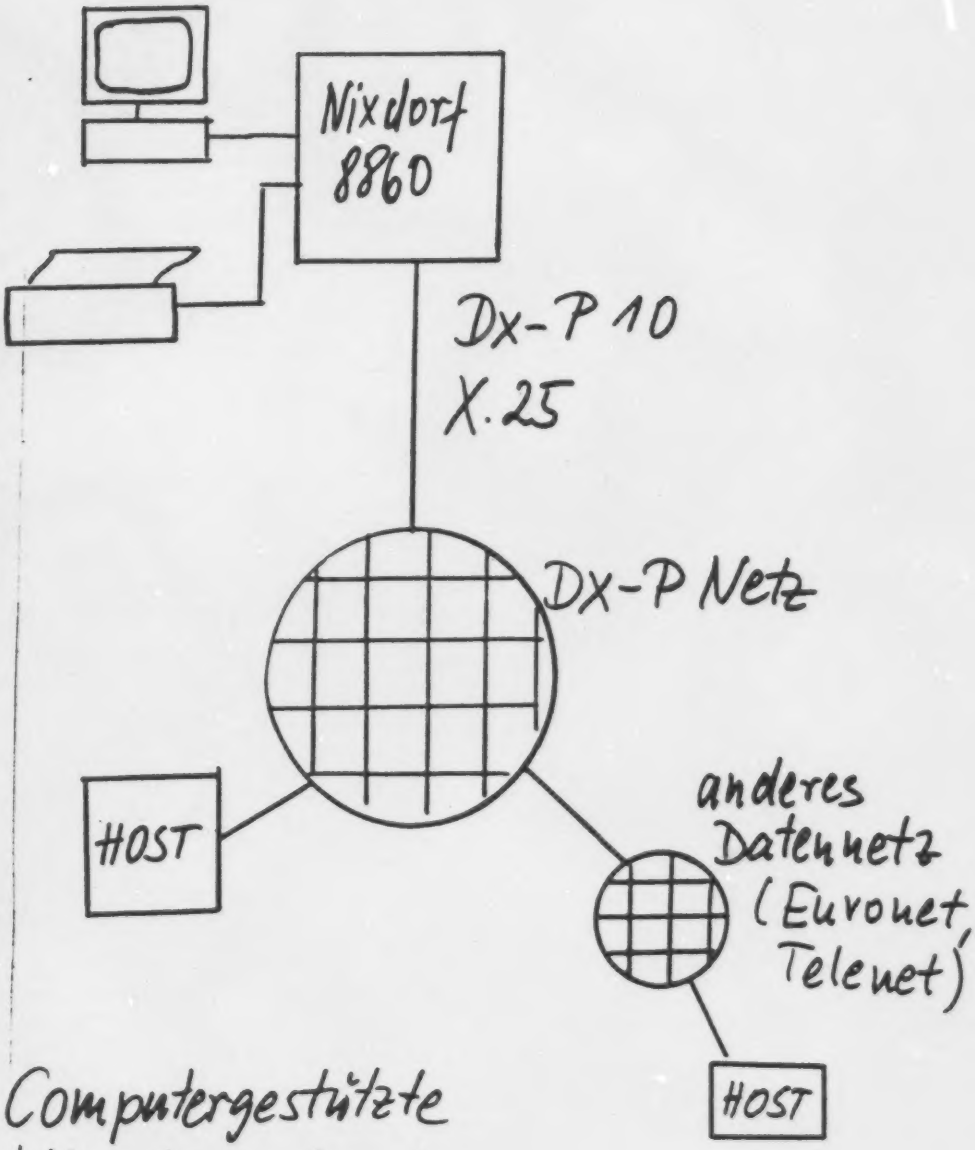

Computergestützte Literaturrecherche mit Dx-P 10

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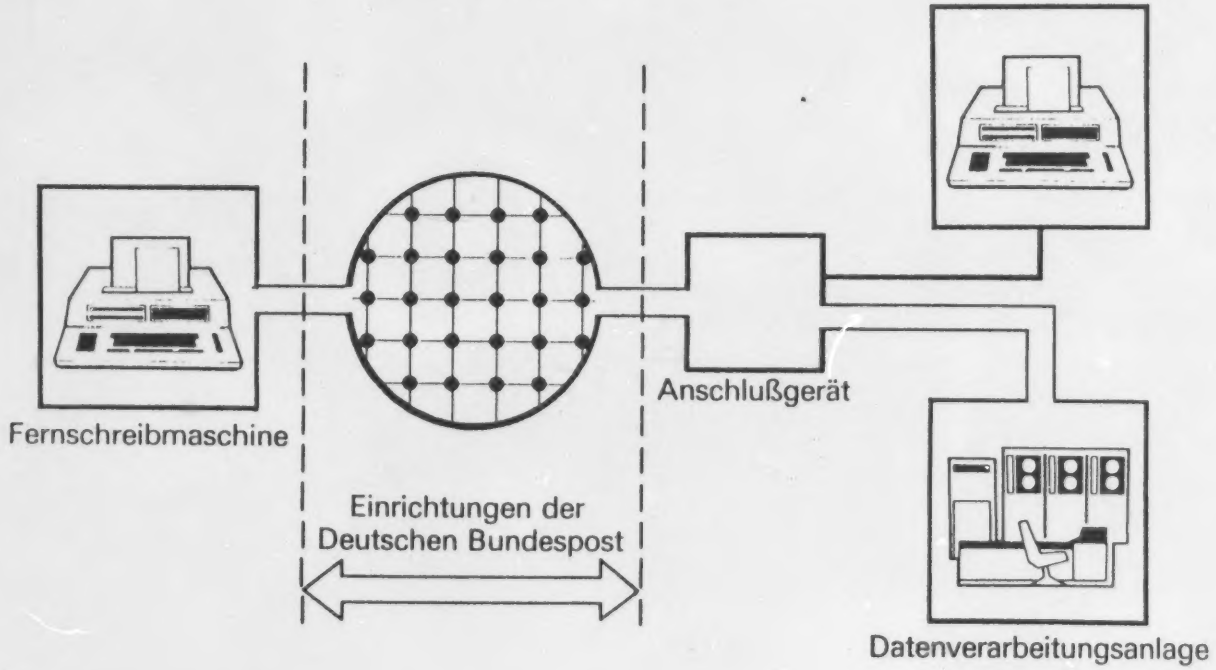
Datenübertragung im Telexnetz

Grundkonfiguration



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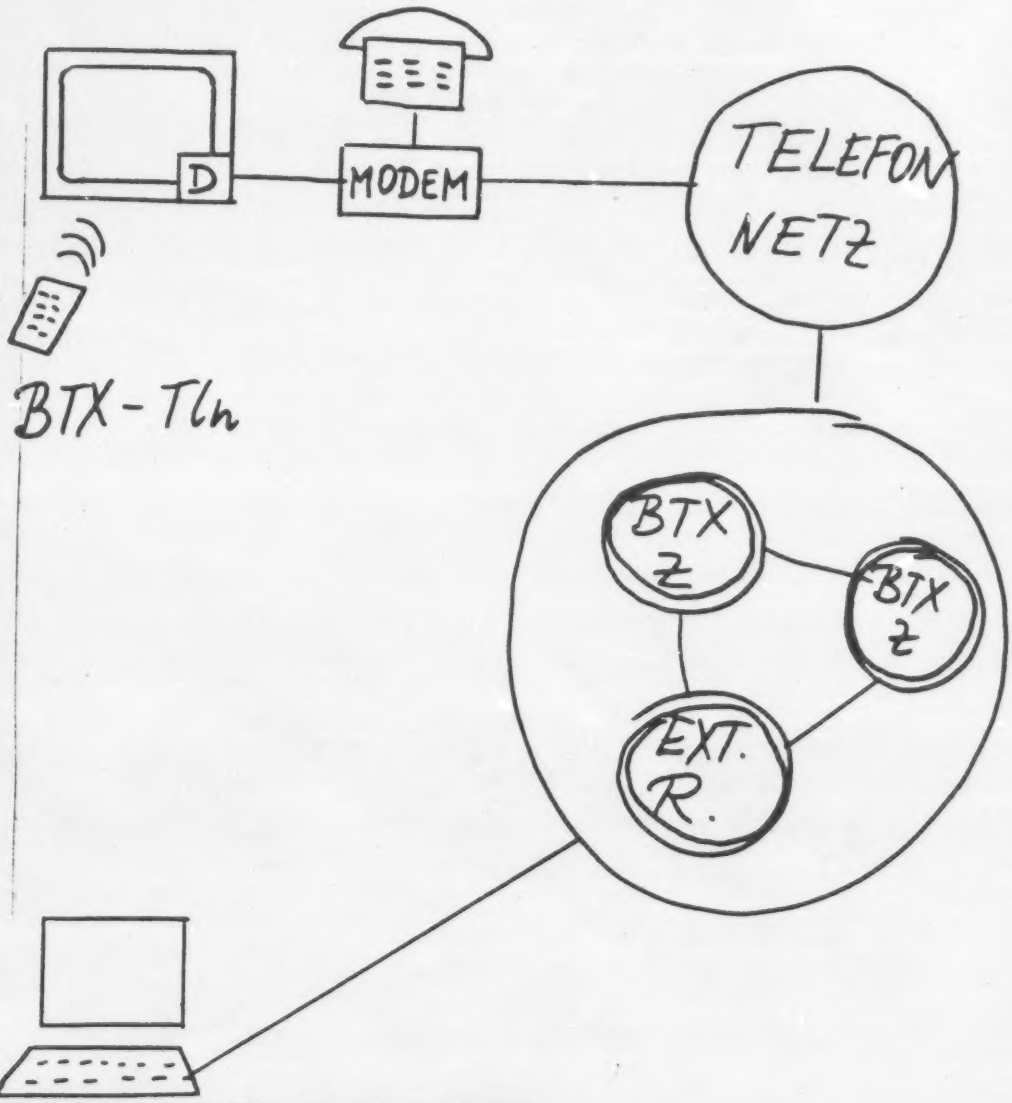
BILDSCHIRMTEXT



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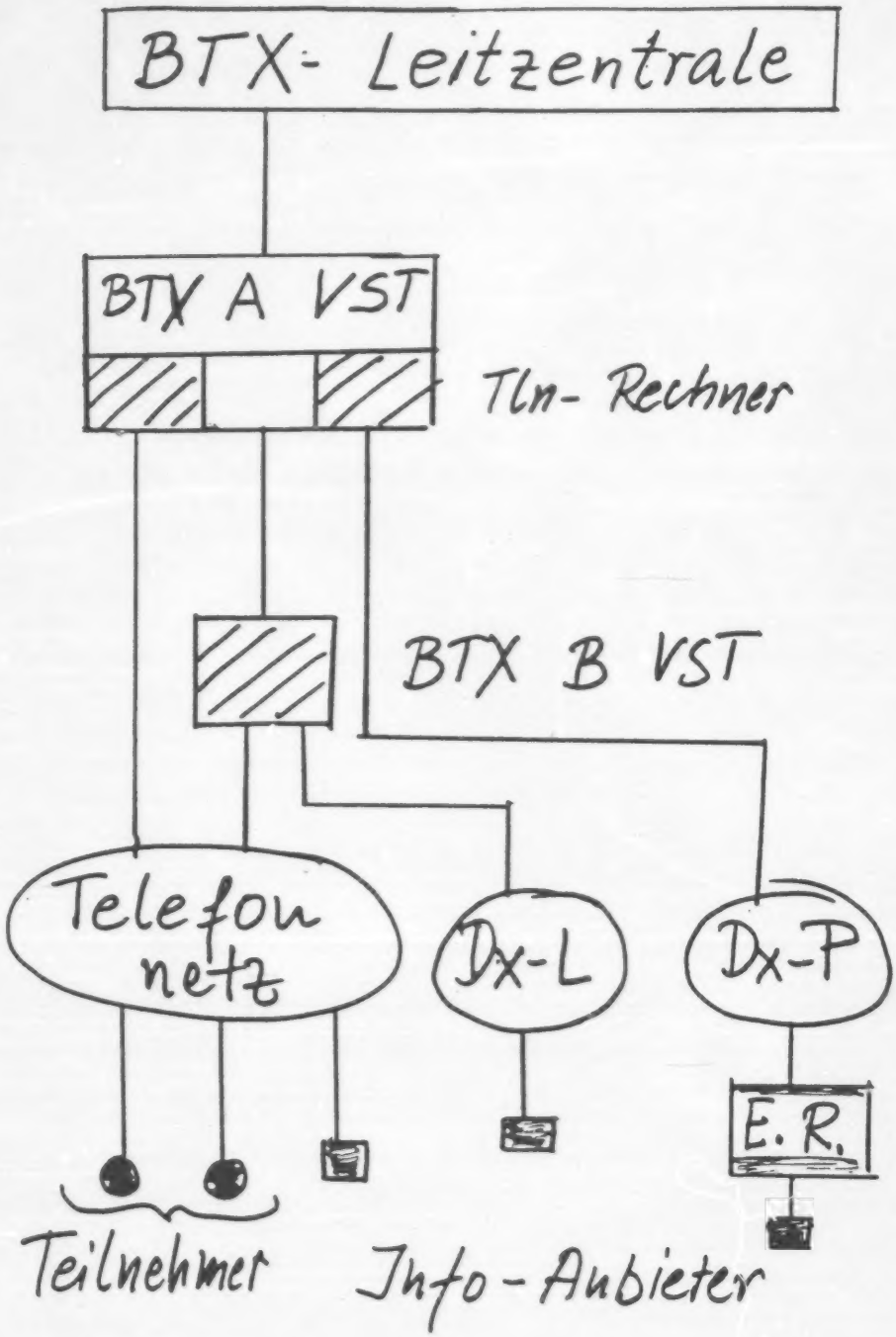

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Section: Administrative Libraries

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ADMINISTRATIVE LIBRARIES IN A TECHNOLOGICAL WORLD:

Bildschirmtext (Videotex): A new information- and communication technology: introduction, experiences and possibilities, with special reference to libraries.

(2) Interactive Videotex Applications in the Library and Information Field. A Look at the developing West German Scene.

by

Gary L. H a r r i s
Society for Information and
Documentation

F r a n k f u r t / Main
FR Germany
in cooperation with Deider, C.
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Interactive Videotex Application in the Library and Information Field

A Look at the Developing West German Scene

The following topics will be ~~treated~~ discussed:

1. Application Areas
2. Videotex Participation and Advantages
3. Merits of Application
4. Some Information Programs
5. Independant Host Computer Linkage ~~with~~ to Videotex

1. Application Areas

Videotex application, in a library context, can be divided into three broad areas. These are innerlibrary, interlibrary and library/user applications.

Within the library, videotex can be seen as an inhouse solution for application to internal organizational needs. Between the libraries, information can be passed on and responded to in an almost dialogue form. Between the library and the user exists the oppurtunity to offer completely new and extensive information and communication services.

Videotex can be used internally as a type of bulletin board for the dissemination of information to staff. Such information could include training information, job vacencies, vacation planning, control of peridocal routing and announcements conserning union activities. In some cases, information could be recieved by staff members in their own personal mailboxes. The videotex terminals could also be used to access newly created files in videotex or existing files in the library's own computer.

Libraries could form a type of closed user group (CUG) for better interlibrary communication. Some information could also be offered to the general public who in this connection might be viewed as a type of remote library user group. Users could access the library's computer conter via gateway interface. Technically seen, videotex uses the public telephone network for the communication of data and can therefore easily be used to open up library and information services to virtually everyone.

Information intermdiaries such as book suppliers can be presented comprehensive indexes of books in print. This service would be particularly well suited for a national library as videotex information provider (IP). Beyond this, indexes of all media like cassettes, films and slides can be made available. An online library service could can be established for users with microcomputers who can then access telesoftware and computer assisted instruction (CAI) programs. Special maps and diagrams on videodisc storage can also be provided.

For the visiting library patron, the videotex terminal can be used among other things to provide a directory to the library and its use. From the same terminal catalogue information can be offered. The library visitor or even home user of videotex could not only be informed of what the library has but also whether or not it is checked out. This type of information and circulation service can save library patrons much inconvenience. The interactive pages of videotex further allow for convenient ~~information~~ electronic ordering of documents, e.g. books and cassettes. Such convenient information and communication services could enhance the interest in library usage as a whole. Handling check outs electronically could also allow for a more exact analysis of library usage. Books which are ordered often could be identified and consequently acquired in satisfactory numbers. Libraries have the opportunity to play the role of an information center by offering more comprehensive information services than otherwise possible. Opening up access to the archive of the Amerikanische Gedenkbibliothek (American Memorial Library) in West Berlin proved to be of particular interest to a large user group of high school students, university students, teachers and journalists. Just as well, additional information could prove to be of interest to the home videotex user e.g. on new books in the library, courses, lectures and workshops, concerts, theater, exhibitions or community events and activities in general.

2. Videotex Participation and Advantages

The successful utilization of videotex will be determined by various factors including the user acceptance and efforts of IP's to make this new medium attractive. Politicians and librarians have been emphasizing the urgency of the expansion of the library's role since decades. And for the improved flow of information in society an obligation exists on the part of the libraries and information centers to investigate the utilization of videotex as a transportation medium for information. Socialy and politicaly seen, whoever is excluded from or hindered by the use of information in society must be considered to be disadvantaged or discriminated against. Minor problems of access to information through fixed business hours for example can be easily solved. The library user can be spared unneccessary inconvenience during vacation times or other temporary closings of the library if he/she is informed of this at home in advance. Via videotex the library user can also learn the call number of a document before even entering the library.

Theoretically, the postal service could be used for the delivery of some documents. Its usefulness is particularly apparent if users are affected by sickness, disability or lack of transportation. Also in light of the high costs connected with the use of mobile libraries and physical hindernesses such as long distances between the user and the information source which affect information dissemination and the extensive provision of literature, videotex must become increasingly attractive as a suitable information and communication medium. Videotex terminals in hospitals, schools and other public establishments would further support the effort of bringing information to the public. Principally however, the library should remain the competent location for document circulation.

3. Merits of Application

Individual libraries may experience increased usage of information services. This could be particularly true for the circulation of books or peridocals which because of their special subject area, their price or limited print are neither available ~~to the public~~ to the public to the extent necessary, nor made use of by the public as much as desired. A greater frequency of library loans of such individual documents could result. New acquisition requests as well as suggestions in general may be collected systematically through the videotex message service.

Through advaced ordering or inquiry from the home videotex terminal, the library patron can be spared some everyday inconveniences like long waiting at circulation desks or inquiries about their loan status. This could be especially important in respect to libraries with very short lending periods. It is to the library's benefit that routine procedures such as checking out books become less time consuming for the library itself. And for the library user it is simpler if, when initiating a library loan, he only has to type in his/her identification number on his/her television screen rather than fill out a lengthy form. The opportunity offered to a user to sit down at a videotex television terminal, search through the online library catalogue, find a book and check it out can be seen as ample justification for the installation of such terminals in the library itself. An expansion of this service would be supplying online videotex catalogues of other libraries as well. In this case, it might even be possible to allow the library user to be the initiator of an interlibrary loan and thereby reduce the amount of trouble and bureaucracy for him/her and the corresponding library staffs. The Fernuniversitaet Hagen (a sort of open or correspondence university) has made an effort in this direction. Especially small libraries could profit by such a service which would in effect expand the volume of holdings which they can offer to their users. The small library could then take over a more important function as a provider of information through increased interlibrary loans.

The following are some of the locations available for the installation of videotex terminals:
- individual homes as already forseen for the public introduction of the German interactive videotex system
- public establishments like hospitals, schools, city and other government information centers, museums, train stations, airports and, of course, libraries.

The first public videotex terminal of Europe was installed in July 1981 at the main entrance of the city computer center of Graz. Three other coin-operated terminals have been in service at the tourist office, city hall and main train station since August of 1982. In December 1982 the Deutsche Bundespost (West German Post and Telecommunications Authority, PTT) installed videotex terminals in West Berlin post offices from which the public user can manage his/her post banking and checking account. The videotex terminal user has the oppurtunity to use the library services from all possible locations without having to require the assistance of the often understaffed library personel. This is especially beneficial for taking care of routine procedures which can often be very time consuming. Some procedures could of course be taken care of with a simple telephone call from the user, but even then the time of day and automatic telephone answering services can represent inconvenient factors. Besides, the message function of an automatic telephone answering service is performed more efficiently in printed form by the electronic mailbox or message service available in videotex.

Of particular importance is the use of videotex features to provide attractive information and communication services which may serve to induce further interest and usage of the library including the users visit of the library for more personal and extensive advising concerning his/her information problems by expert library or information center staff.

One application example is the information program of the GID in which "charge" pages are used for the ordering of documents as well as the billing of the user for the documents. The user who is viewing a videotex page with information (f.e. title, source, length, keyword and copy fee) on a periodical article of his interest can leave the displayed page and access a corresponding "charge" order-page on which he places his order electronically using his keyboard or keypad and on which upon accessing of the page his videotex account by the West German Bundespost (Post and Telecommunications Authority, PTT) is automatically debited with the fee charged by the GID for sending copied pages of the article to the user Time and trouble are saved both for the user and the information provider through the PTT's automatic billing services. Both the user as subscriber and the library or information center as information provider have an account at the PTT. Therefore accessing "charge" pages in videotex automatically results in the user's account being debited and the IP's account being credited. The PTT receives a small percentage of the fees being charged by the IP for each transaction.

The arguments mentioned supporting improved interaction between the user and the library are likewise applicable to the interlibrary communication within the videotex system network.

4. Some Information Programs

Currently there is a variety of information providers listed in the videotex system keyword index under libraries.

The Federal Statistic; Bureau offers an overview of libraries within the Federal Republic of Germany with reference to their locations; type e.g. national, city, state and university; and holdings.

The Presseamt (Press Office) of Berlin offers a directory to Berlin libraries listed according to city district. The Deutsche Bibliotheksinstitut, DBI (German Library Institute) offers an index with adresses of Berlin libraries, a calendar of library events, a presentation of its own research activities, and an especially "user-friendly" referral feature: On the main-index page the user is informed of the information program of the Society for Information and Documentation (GID) which offers an overview of special libraries. The user can then exit the DBI program by typing in the corresponding number of the index category and thereby directly access a relevant information page within the information program of the GID. In the past, library users have most often made use of the library closest to them, - perhaps at the cost of their information needs. Videotex opens up completely new possibilities for the user. He/She can sit in his living-room chair and make use of the information services of a variety of libraries and information providers on a nationwide basis. If represented in appropriate numbers, libraries and similar information providers can supply an almost unlimited wealth of knowledge and information services at the fingertips of their users by selective cross-referencing and connecting of information programs.

Folio

Another example of information contents and services offered in the library and information field can be taken #693993#, from the information program of the Society for Information and Documentation (GID). The GID, a state and federally-funded government institution with focus on applied research and development has utilized, in part, information material and services of its own special library and information center.

The information program is structured into nine main content areas or branches.
They are:

1 Information Centers
2 Information Intermediaries
3 Central or Special Libraries
4 Infrastructure or Central Institutions
5 Learned Societies and Professional Associations
6 Educational Institutions
7 Current Information to Videotex
8 Current Information to Information and Documentation
9 Umbrella Service for Information Providers.

Institutions cited in Branches 1 - 6 were selected from GID printed indexes. A number of these institutions are also information providers and are therefore referred to with a videotex page number so that the user can be directly connected to the corresponding programs.

Among the institutions listed in branch 4 infrastructure or central institutions of the information and documentation field is the Deutsche Bibliotheksinstitut, DBI. Through cross-referencing of programs both the DBI and the GID took the opportunity to expand the pools of information offered to their videotex users.

Branch 7 of the GID program contains courses, seminars etc., research projects and reports, articles and search service as well as test pages which demonstrate some videotex technology.

Of particular interest to professional information provision via videotex is the program content area called articles and INFODATA search service. This content area makes use of the holdings and information services of the GID-Library. The videotex editor receives in monthly intervals the newest articles from professional journals on videotex. From these a selection is made and offered to the videotex user even before the articles are entered by the next update into the GID's INFODATA databank for information science and information work. ...

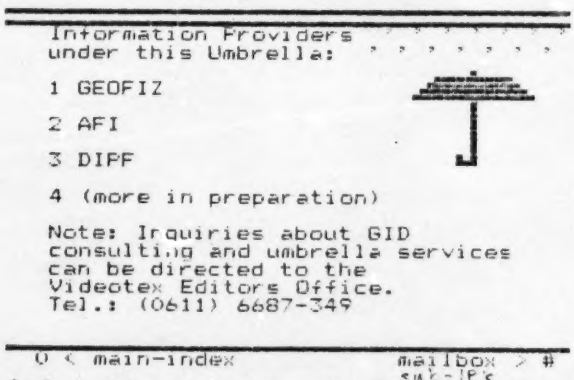
...References to these articles are made on videotex information pages that also offer the opportunity to order copies via videotex order pages. The user who is interested in further literature, can order from a selection of two standard profiles or he/she can use his/her alphanumeric keyboard to type a retrospective search request for the INFODATA databank into an order page which is later carried out by GID staff and mailed to him/her.

Developmental work currently going on in the GID could extend the search service as to enable users to perform searches directly from videotex terminals via videotex system. This direct accessing of independent host computers of IP's can be a significant step in further expanding information services.

Another branch of GID information program offers typical videotex information contents under the heading of Current Information and Documentations (I&D). Included are I&D news, GID publications; research reports; seminars, courses, workshops etc. and; a special I&D calendar.

Branch 9 of the information program is the Umbrella Service which contains sub-IP's whose programs are developed with GID consultation in the videotex system storage space made available to the GID by the PTT.

GID Umbrella-Service



The information programs of all sub-IP's refer to the index page of the GID Umbrella Service so that users who are merely interested in one of the IP's become acquainted with the others even if they do not make use of the information programs of the other public institutions represented.

One IP of interest represented in the Umbrella Service is the Library of the German Institute for International Educational Research (DIPF). Its information program is characteristic of information contents and services offered by IP's of the library field participating in the field trials that will end in May 1984.

With the official nationwide introduction of West German interactive a new European (CEPT) standard for system software will be implemented and new IP's, among others of course new libraries can be accepted into the system.

The current DIPF program's main content areas or so called branches are:

1 Library and Documentation Centers
2 Literature Information Service
3 DIPF Publications
4 DIPF Seminars
5 Documentation Ring Education (DOPAED)

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DIPF Library & Documentation

German Institute for International Educational Research (DIPF)

Deutsches Institut für Internationale Pädagogische Forschung -Bibliothek + Dokumentation-

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M A I N - I N D E X

1 Library & Documentation Center

2 Literature Information Service

3 DIPF Publications

4 DIPF Seminars

5 Documentation Ring Education (DOPAED)

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Under the first heading of Library and Documentation Centers general information on the holdings and hours of the individual libraries of DIPF are to be found. A monthly printed index of new acquisitions can be orderd for more detailed information.

The Literature Information Service offers the opportunity to order a printed index of newspaper articles and gives references to periodical articles which are continuously updated as sample selections that can be ordered by the user. Charging the user for the copies of the articles is automatic when the user accesses the order-pages. A search service is offered to the user who wishes more information on the subject area of multicultural education. The user accesses an order page on which he types in a search request for literature from the archive. The completed order-page with search request appears subsequently immediately on the IP's terminal as a new system message which can then be printed out and directed to a DIPF staff member for processing.

The third branch lists a selection of DIPF publications on a series of information pages. From each information page it is possible to access a corresponding order-page on which the user enters the number of copies he/she wishes to have. After printing out these orders, a staff member sends the desired publication with invoice to the user by mail.

The fourth branch uses videotex as a medium to announce DIPF's own seminars. Furthermore, the interactive pages of videotex allow the user to register immediately for a seminar of his interest. Also written confirmation of the user's registration can be delivered via videotex faster than otherwise possible.

The fifth and final branch of the DIPF information program contains descriptive information about an organization to which DIPF belongs: Documentation Ring Education (Dokumentationsring Pädagogik, DOPAED). Some of the institutions cooperating within the documentation network of DOPAED are listed and briefly presented with relevance to their focus on subject areas treated and information and documentation services provided.

5. Independent Host Computer Linkage to Videotex

Project work is being conducted at the GID to develop the linkage of independent host computers to the PTT videotex system to the level of application.

The IBM System 3031 was connected to Videotex via "Gateway" interface. A software package was implemented which supports the PTT's videotex protocols of the current field trials. The software possesses the following characteristics:

a) It offers the possibility to arrange videotex compatible page storage as well as the searching of information according to the hierarchical videotex tree structure principal.

b) It makes the use of the Information Retrieval System STAIRS possible.

Consequently, it is possible to use videotex terminals to access independent host computers in order to carry out online searches, for information either in the hierarchical structured page storage or in the normal STAIRS structured data banks implemented on the GID's host computer.

For test purposes it is already possible to access the GID INFODATA database for information science and ~~practice~~ information work and the BIBLIODATA database of the Deutsche Bibliothek, DB (German National Library). ~~The INFODATA database can be~~ accessed in its entirety in a converted videotex format. The BIBLIODATA database is only available in part in converted videotex format. The INFODATA database can be accessed in its entirety in a converted videotex format.

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ABSTRACT

Possible applications and advantages of interactive videotex in the library and information field are presented. Innerlibrary, interlibrary and library user oriented applications cited include among other things videotex utilization as a bulletin board type of information dissemination for library hours, holdings, new acquisitions, calendars of events and online referral. Special interactive applications include: electronic document ordering and message services, and; accessing of external videotex-compatible host computers via videotex gateway interface for information retrieval in online databases.

Some information programs in the Bildschirmtext (German interactive vidoetex) system are described and further serve to exemplify the first initiatives of libraries and information centers in the current but in May 1984 ending West German interactive videotex field trials.